



NATIONAL TRAINING CENTER

Protective Force Training Department

Standard Operating Procedure

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REVISION HISTORY

Rev.	Date	Description of Revision
1	04/25/08	Re-designated as a PFT (600-level) SOP. Revised to update procedures as indicated by sidebars in right margin.
0	03/26/07	Added blue sheet for Echota Technologies Corporation

1.0 PURPOSE AND OBJECTIVES

- 1.1 The purpose of this standard operating procedure (SOP) is to ensure the U.S. Department of Energy (DOE) National Training Center (NTC) conducts training activities involving engagement simulation systems (ESSs) safely and in compliance with applicable regulations.
- 1.2 The DOE/NTC requires that performance tests (PTs) be used to: (1) realistically evaluate and verify the effectiveness of its Protective Force Training Department (PFTD) programs; (2) identify and provide training for DOE, DOE contractor, and other government agencies personnel; (3) identify areas requiring improvements; (4) validate implemented improvements; and (5) motivate student personnel. DOE and DOE contractor Security Police Officers (SPOs) must, through training, maintain competencies needed to perform assigned tasks required to fulfill the DOE sites' protective force mission.
- 1.3 The objective of this SOP is to ensure the NTC has a written procedure for the safe conduct of training activities using ESSs.
- 1.4 NTC PFTD ESS training activities are primarily used to simulate conditions during PFTD PTs and training activities involving force-on-force and deadly force-related situations. The use of ESS allows data to be collected to evaluate student performance in numerous areas (e.g., individual and team tactics, firearms proficiency, tactical movement, deadly force training, etc.). ESS also provides a means to validate protection strategies and provide hands-on training to protective force personnel.
- 1.5 The requirements in this SOP pertain to the use of ESS during the conduct of PFTD PTs and training activities at the NTC. In many cases, these requirements specifically address the conduct of force-on-force PTs. However, they must also be applied, as applicable, to PFTD limited-scope performance tests (LSPTs) and training activities involving one-on-one and deadly force engagements.
- 1.6 PFTD PTs and training activities must be conducted with the highest regard for the safety and health of personnel, protection of the environment, and protection of government property. Safety issues must be considered from the inception to completion of these activities in accordance with Integrated Safety Management process. DOE and NTC directives require that all applicable safety standards and requirements be met prior to conducting PTs and training activities involving the use of ESS and associated equipment.
- 1.7 The NTC is not an operational site with a protective force mission. Therefore, all requirements for the implementation of a shadow force do not apply to NTC training. For ESS training conducted at any DOE/National Nuclear Security Administration (NNSA) site, all requirements for the implementation of a shadow force must adhere to that site's specific procedures.

2.0 SCOPE

The procedures and responsibilities in this SOP are applicable to all DOE/NTC employees as well as all outside agencies that utilize the NTC's facilities or equipment for ESS training. All participants involved in ESS training are required to adhere to the policies set forth in this SOP.

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This SOP was prepared by the Protective Force Training Department and is scheduled for annual review in March 2009.

3.0 CANCELLATION

This procedure supersedes NTC SOP 546, *Dye Marking Cartridges*, dated July 2006.

4.0 REFERENCES

- 4.1 DOE Guide 450.4-1B, Integrated Safety Management System
- 4.2 DOE Manual 470.4-3 Chg 1, Protective Force (or current version)
- 4.3 NTC-SOP-531, Risk Analysis
- 4.4 PFT-SOP-644, Live Fire Range Operations
- 4.5 PFT-SOP-645, Live Fire Shoot House
- 4.6 PFT-SOP-649, Storage and Transportation of Explosives

5.0 DEFINITIONS

- 5.1 **BLANK-FIRE SYSTEMS.** Specially modified duty firearms (that cannot fire live ammunition or projectiles) and blank-fire cartridges (loaded with powder but containing no projectile) designed to provide realism during PTs and protective force training on the use of deadly force and the escalation of the force continuum. The blank fire weapon systems are color-coded ORANGE.
- 5.2 **DYE-MARKING CARTRIDGE (DMC)-MODIFIED FIREARM.** A firearm that has been temporarily modified or designated as a permanent DMC weapon that feeds, fires, and functions DMC ammunition. A firearm modified with the conversion kit reduces the ability to feed and fire lethal ammunition. All NTC firearms and magazines designated for DMC weapon systems are color-coded BLUE.
- 5.3 **ESS CONTROLLER.** The individual responsible for issuing and accounting for all ESS weapons and equipment, inspecting all ESS ammunition, and collecting the equipment following an exercise.
- 5.4 **ESS TRAINING AREA.** An area where NTC-sponsored ESS training is permitted. These areas include, but are not limited to, approved areas of No Sweat Blvd., the Live Fire Shoot House at the LFR (on a case-by-case basis), the Integrated Safety and Security Training and Evaluation Complex (ISSTEC), and the OST Tactical Training Facility. Such training areas are inspected to ensure they are free of live ammunition, unconverted weapons, unmarked magazines, edged or impact weapons, and oleo capsicum (OC) weapons (also known as "pepper spray"). In addition, all participants will be searched for the above contraband items prior to entering the training area.
- 5.5 **ESS TRAINING OBSERVER.** An individual who has authorization to enter the ESS training area solely to observe training activity. Authorization to enter the training area will be granted on a case-by-case basis by the Senior Controller. Prior to any observer entering the ESS training area, the Senior Controller will provide a detailed safety briefing and issue all personal protective equipment (PPE) listed in Section 8.5.1 of this SOP. The Senior

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Controller will ensure each individual receiving authorization to enter the ESS training area is inspected and searched for unauthorized weapons and ammunition.

- 5.6 ESS TRAINING PARTICIPANT. An individual who participates in training activities as either a student or role player and, as such, must be trained in ESS use. Such individuals must be inspected, searched, and found to be free of any live ammunition, unconverted weapons, unmarked magazines, edged or impact weapons, and OC weapons before participating in activities. The inspection process will be conducted by the Senior Controller (or designee) and the Safety Controller.
- 5.7 ESS WEAPONS AND EQUIPMENT:
- A. COMBINATION MILES AND DMC SYSTEMS (HYBRID). The combination Hybrid system that uses the existing DMC weapon system and mounts the MILES laser transmitter to the DMC weapon. The weapon system will be color-coded BLUE, and the laser will have the BLACK caution decal.
 - B. INERT WEAPONS SYSTEMS. Inert weapons systems consist of simulated firearms and weapons or actual firearms and weapons that have been rendered incapable of firing live or blank-fire ammunition. Inert weapons systems are typically used to simulate firearms and weapons during PF control and restraint training and LSPTs.
 - C. MULTIPLE INTEGRATED LASER ENGAGEMENT SYSTEMS (MILES). A modified weapon system that uses blank ammunition which, when fired, activates a laser transmitter that will record hits on an Infrared sensor worn on a harness. MILES is color-coded ORANGE, and the laser must possess a BLACK caution sticker in accordance to DOE M 470.4-3 Chg 1 (or current version).
- 5.8 EVENT CONTROLLER. The individual possessing sufficient tactical expertise, knowledge, and physical ability to ensure that his/her presence does not interfere with or hamper the exercise. Event Controllers are responsible for specific exercise events and may be assigned to both the protective force and adversary force.
- 5.9 SAFETY CONTROLLER. A dedicated individual responsible for assessing the exercise plan, ensuring the walk-downs of the exercise area and safety briefings are conducted, and ensuring all safety requirements are being met.
- 5.10 SENIOR CONTROLLER. The individual (generally, the Lead Instructor) who reports directly to the Exercise Director and is responsible for coordinating, establishing, and supervising the exercise controller staff. The Senior Controller ensures all persons, equipment, and vehicles entering the ESS training area are searched prior to entering the ESS training area. Prior to establishing the ESS training area, the Senior Controller and Safety Controller will search the immediate area for unauthorized weapons and ammunition. The Senior Controller and Safety Controller will then inspect each other for unauthorized weapons and ammunition. Once completed, the ESS training area will be cordoned off by the Senior Controller and Safety Controller. The Senior Controller and Safety Controller will then inspect the remaining Controller and support personnel prior to these individuals entering the secure ESS training area.

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6.0 POLICY

It is NTC policy that all ESS training activities adhere to the firearms training safety requirements found in the reference documents listed in Section 4.0 in this SOP. Prior to ESS training, agencies requiring an agency agreement (e.g., Range Use Agreement [RUA], Memorandum of Agreement [MOA], Memorandum of Understanding [MOU], or Letter of Agreement [LOA]) must prepare a request and ESS Training Activity Plan (see Appendix D), and forward it with any other supporting documentation (e.g., ESS qualifications, certifications, etc.) to the NTC Director.

7.0 RESPONSIBILITIES

Although each individual is responsible for his or her duties listed in this section, these duties may be delegated to another individual who is equally qualified to perform the same function.

Additional responsibilities are included in Appendix A, *Safety*, Section A.2, and Appendix E, *Command and Control*, Sections E-2 and E-3.

7.1 DOE/NTC Director

- 7.1.1 Ensures this document is available to all DOE/NTC staff.
- 7.1.2 Requires DOE/NTC staff to read and adhere to this document, as appropriate to their area(s) of responsibility.

7.2 NTC General Manager

The NTC General Manager is responsible for ensuring the activities that are conducted at the NTC using ESS comply with the requirements of all applicable regulations and this SOP.

7.3 Senior Controller/Exercise Director

Due to the limited scope of training exercises at the NTC, the Senior Controller may serve as Exercise Director. The Senior Controller is responsible for the overall conduct of training involving the use of ESS and for ensuring the actions below are completed prior to and during all training activities.

- 7.3.1 Ensure a Training Activity Plan is developed and approved for each ESS training activity that is in accordance with guidelines established in DOE M 470.4-3 Chg 1 (or current version). All training involving ESS weapons must have an approved ESS Exercise Plan, ESS Training Safety Plan, and risk analysis report in effect prior to training.

NOTE: See Appendix F, *Performance Test and Training Activities Planning*.

- 7.3.2 Establish and maintain communications with all Controllers throughout the duration of training.
- 7.3.3 Conduct a safety inspection of the training area prior to training. Ensure proper warning signs and flags are posted and lights are used for low-light training.

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- 7.3.4 During the safety inspection, identify and mark hazards, hazardous areas, and off-limits areas.
- 7.3.5 Ensure required safety briefings are provided to students, Controllers, role players, Opposition Force (OPFOR), evaluators, and observers.
- 7.3.6 Conduct a safety briefing for everyone involved in the training. The safety briefing will include rules of engagement (ROE); out-of-play, hazardous, or off-limit areas; available medical support; ESS safety; and vehicle, fire, and personnel safety.
- 7.3.7 Ensure emergency vehicles are not delayed when responding to emergencies in the training area.
- 7.3.8 Notify all persons in the exercise and surrounding areas of the time and location of planned ESS training activities.
- 7.3.9 Ensure ESS training firearms and ammunition are not issued until all live firearms and ammunition have been collected, accounted for, and secured.
- 7.3.10 Ensure all NTC ESS weapons conversions are performed by DOE-certified Armorers. For non-NTC weapons conversions, DOE-certified Armorers will inspect all converted weapons prior to commencement of exercises. ESS ammunition will be distributed and loaded within the ESS training area.
- 7.3.11 Ensure all personnel entering the ESS training area have been inspected for contraband (live ammunition, bladed weapons, live fire weapons, pepper spray, etc.).
- 7.3.12 Inform all participants of the requirement to call "CEASE FIRE" if they observe a safety violation or unsafe condition. The Senior Controller will then declare an "EXERCISE FREEZE" until the situation is safely resolved.
- 7.3.13 Assign Controllers or support personnel to prohibit unauthorized access to the ESS training area and prevent the introduction of lethal firearms, ammunition, unauthorized personnel, or persons without the appropriate PPE.

7.4 Exercise Controller(s)

Exercise Controllers assist the Senior Controller and have specific responsibilities during ESS training. Multiple controllers are often needed when running more than one scenario at the same training site. They work directly for the Senior Controller and are responsible for enforcing or implementing the following requirements during training activities.

- 7.4.1 Ensure no live ammunition, unconverted or unmarked weapons, unmarked magazines, edged or impact weapons, and OC weapons are allowed into the training area.
- 7.4.2 Stop training if unsafe conditions arise.
- 7.4.3 Ensure all students, role players, and observers are wearing required PPE prior to training.
- 7.4.4 Ensure all participants adhere to specified exercise boundaries.

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- 7.4.5 Conduct safety inspections of assigned training areas, and inspect all participants in their area for live ammunition, unmodified or unmarked weapons, prohibited articles, and PPE wear. Controllers report inspection results to the Senior Controller prior to beginning training. Prior to the beginning of each scenario, Controllers advise the Senior Controller when their areas are ready.
- 7.4.6 Ensure all participants and observers in their area comply with ROE and training safety requirements.
- 7.4.7 Ensure accountability of participants, observers, and equipment at the end of training, and report the results to the Senior Controller.
- 7.4.8 Recommend to the Senior Controller that an "EXERCISE FREEZE" be declared if safety or operational issues arise, and ensure training does not resume until the issue has been safely resolved.
- 7.4.9 The Senior Controller will appoint Special Controllers, when necessary, to oversee specific exercise events, functions, or personnel (e.g., Event Controller, Vehicle Controller, Role Player Controller).

7.5 Safety Controller

The Senior Controller will appoint a qualified instructor as the Safety Controller to be responsible for the duties below.

- 7.5.1 Assess ESS training plans, and ensure that walk-downs of the exercise area and safety briefings are conducted.
- 7.5.2 Ensure safety briefings specify the ROE, available medical support, ESS weapons safety, and vehicle, fire, and personnel safety.
- 7.5.3 Review the training scenario with the Senior Controller.
- 7.5.4 Conduct a safety inspection of the training area with the Senior Controller prior to commencement.
- 7.5.5 Provide support to the Senior Controller and remain in contact with the Senior Controller at all times during the exercise.
- 7.5.6 Mark the ESS training area and approved entry/exit points with tape. At night, mark the area with chemical light sticks.
- 7.5.7 Ensure a Paramedic is on duty and can be contacted by radio prior to training.
- 7.5.8 Release the Paramedic when they are no longer required.

NOTE: NTC training courses may be conducted on a temporary basis without the presence of a Paramedic with prior approval from the PFT Manager or Range Master.

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- 7.5.9 When safety requirements have been met, advise the Senior Controller that training may begin.

NOTE: See Appendix E, *Command and Control*, Section E.3 (3) for details of responsibilities.

7.6 Armorer

- 7.6.1 Prior to each training event, inspect all ESS weapons for proper safety devices and proper color-coding.
- 7.6.2 Prior to each training event, issue all ESS weapons to the ESS Controller. (The ESS Controller will sign for all weapons received and return all ESS weapons to the Armorer at the end of training.)

7.7 ESS Controller

The Senior Controller will appoint an ESS Controller who has the following responsibilities:

- 7.7.1 Inspect all ammunition prior to issue to exercise participants.
- 7.7.2 Test ESS equipment for operability prior to issue.
- 7.7.3 Collect all ESS firearms, ammunition, and pyrotechnics at the end of training.
- 7.7.4 Designate secure offsite holding areas for lethal weapons or ammunition found during pre-exercise searches of personnel, vehicles, and equipment.
- 7.7.5 Supervise the loading of all ammunition into magazines.
- 7.7.6 Supervise the issue and turn-in of ESS weapons, ammunition, magazines, and related training aids.

7.8 Paramedic

A Paramedic must be present during NTC-sponsored ESS training. An exception to this requirement may be granted on a temporary basis with prior approval from the Range Master or PFT Manager. Approval is based on the presence at the training site of an NTC Instructor who is currently trained and certified in first aid and CPR and is in possession of a medical trauma kit. The approval will be documented, and copies will be provided to the PFT Manager and the Environment, Safety, Health, and Quality Assurance (ESH&QA) Department.

7.9 Role Players

Role players will be briefed by their Controller and will follow Controller instructions in order to achieve the desired training objectives and avoid potentially hazardous situations. Role players are responsible for the safe use of their issued ESS weapons, equipment, and training aids, and for complying with exercise safety requirements. Role players will also be expected to:

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- 7.9.1 Not deviate from the exercise scenario script except to call "CEASE FIRE" in the event of a safety problem. The Senior Controller will then declare "EXERCISE FREEZE" until the issue is safely resolved.
- 7.9.2 Adhere to designated out-of-play, hazardous, or off-limit areas.
- 7.9.3 Constantly monitor their physical condition for signs of overexertion or illness.
- 7.9.4 Report all injuries, no matter how slight, to the nearest Controller for referral to the Paramedic.
- 7.9.5 Inspect issued ESS weapons, magazines, and ammunition to ensure weapons have been appropriately modified and marked, magazines are modified and marked, and that no live ammunition is present.
- 7.9.6 Not engage in physical contact with participants. The only physical contact allowed between role players and exercise participants is when a suspect is placed in simulated custody. Physical contact during a role-player arrest is limited to searching and handcuffing.
- 7.9.7 Avoid the hot propellant gases vented from the ESS training firearms.
- 7.9.8 Use caution when within 3 meters (10 feet) of combatant. Call "DANGER CLOSE" or "CLOSE KILL."

7.10 Students

Students will be involved in training scenarios that use ESS training weapons, ammunition, and simulators. Students are responsible for the safe use of their ESS training weapons and ammunition and will be briefed to take the following actions:

- 7.10.1 Call "CEASE FIRE" for any safety-related reason.

NOTE: Any participant may call "CEASE FIRE" if they observe a safety hazard. The nearest Controller will advise the Senior Controller to declare "EXERCISE FREEZE" until the situation is safely resolved.
- 7.10.2 Adhere to designated out-of-play, hazardous, or off-limit areas.
- 7.10.3 Monitor personal physical condition for signs of overexertion or illness.
- 7.10.4 Report all injuries, no matter how slight, to the nearest Controller for referral to the Paramedic.
- 7.10.5 Inspect issued ESS weapons, magazines, and ammunition to ensure that ESS weapons are appropriately modified and marked, magazines are modified and marked, and no live ammunition is present.
- 7.10.6 Not engage in physical contact with other participants. The only physical contact allowed between role players and participants is when a suspect is placed in simulated custody. Physical contact during a role player arrest is limited to searching and handcuffing.

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- 7.10.7 Not attempt to disarm any participant or role player by grabbing their firearm or person.
- 7.10.8 Avoid the hot propellant gases vented from training firearms systems.
- 7.10.9 Use caution when within 3 meters (10 feet) of combatant. Call "DANGER CLOSE" or "CLOSE KILL."

7.11 OPFOR Controller

The OPFOR Controller must possess sufficient tactical expertise, knowledge, and physical ability to ensure that his/her presence does not interfere with, or hamper the actions of, the OPFOR in completing planned scenario actions. The OPFOR Controller is responsible for ensuring:

- A. Voice communications are established and maintained with the Senior Controller throughout the course of the exercise.
- B. The OPFOR adheres to the ROE and planned scenario(s) actions.
- C. Adherence to specified exercise boundaries.

8.0 OPERATIONS

Unless otherwise indicated, the procedures in this section apply to all students, Controllers, observers, and other participants involved in ESS training.

8.1 General

Safety is a major concern in any ESS training activity. Safety rules must be followed to minimize the potential for accidents/injuries during activities involving the use of ESS. NTC management, Controllers, and participants must anticipate and react to unsafe situations. Realism must be achieved and safety must be considered in the actions of all participating personnel. Integrating realistic safety requirements into scenarios involving ESS enhances participant safety under both operational and ESS activities.

Safety is paramount in exercise planning and execution. Controllers are responsible for ensuring that all operations are conducted safely. Any participant may call "CEASE FIRE" if an unsafe condition is observed. Training may not resume until all safety issues have been resolved.

See Appendix A, *Safety*, for additional information.

- 8.1.1 To prevent the accidental loading of live ammunition into ESS training firearms, a conversion kit will be installed by a certified Armorer. Firearms that have been modified as ESS weapons will be inventoried by serial number and stored in designated areas separate from live-fire weapons storage areas. Modification of an ESS weapon is considered permanent, and the weapon will not be reactivated to a live fire weapon unless specifically approved by the NTC Director.
- 8.1.2 ESS ammunition will be stored separately from live ammunition and in accordance with PFT-SOP-649, Storage and Transportation of Explosives.

NON-PROPRIETARY INFORMATION

This SOP was prepared by the Protective Force Training Department and is scheduled for annual review in March 2009.

- 8.1.3 All NTC ESS weapons used for training will be dedicated for ESS only, stored with the conversion kits installed, and clearly marked. NTC weapons that have been modified for ESS use are identifiable by color-coded upper receivers and slides. Magazines authorized for use with these weapons are also clearly marked with the appropriate color code. Only weapons and magazines with these markings will be authorized for use in ESS weapons training at the NTC.
- 8.1.4 During training, dedicated ESS weapons will be closely controlled and kept separate by physical barrier from firearms capable of firing live ammunition.
- 8.1.5 The Senior Controller is responsible for preparing an exercise plan, which must be approved by the ES&H Program Manager (ESHPM) and the PFT Manager (or designee). The ESS Training Safety Plan and risk analysis reports will be prepared by the ESH&QA Department.

8.2 NTC ESS Systems

- 8.2.1 Multiple Integrated Laser Engagement System (MILES). A modified weapon system that uses blank ammunition. When fired, a MILES weapon activates a laser transmitter that will record activity on an Infrared sensor worn on a harness. Because of the blank ammunition, MILES weapons should never be fired closer than 10 feet (3 meters) to another person. Though the low-energy laser transmitters are considered “eye safe”, no one should stare into a transmitting laser any closer than 40 feet (13 meters) or look through an optical instrument any closer than 250 feet (80 meters). Training with MILES weapons requires wearing approved hearing and eye protection.
- 8.2.2 Dye Marking Cartridge (DMC) Weapons. Weapons that fire non-lethal projectiles designed to maintain accuracy of 6 inches (15 centimeters) at 25 feet (8 meters). Tactical accuracy is 7 to 10 yards (6 to 9 meters) in most handguns and up to 25 yards (23 meters) in submachine guns and rifles. The maximum range is 145 yards (133 meters). A minimum safe firing distance of 3.39 feet (1 meter) from another person must be maintained during training. DMC fires a projectile, so full face, head, and neck protection is required for participants. It is strongly recommended that participants wear long-sleeve shirts with sleeves rolled down and long trousers, as DMC strikes on bare skin can be painful.
- 8.2.3 Hybrid System. The combination hybrid system that uses the existing DMC weapon system and mounts the MILES laser transmitter to the DMC weapon. The weapon system will be color-coded BLUE, and the laser will have the BLACK caution decal.

8.3 ESS Safety Requirements

- 8.3.1 Senior Controller: Responsible for the following:
 - 8.3.1.1 Inspect the training area for potential hazards prior to training.
 - 8.3.1.2 Ensure Controllers, students, observers, and other participants wear proper PPE prior to beginning of training.
 - 8.3.1.3 Assist the Safety Controller in resolving pre-exercise safety issues.

NON-PROPRIETARY INFORMATION

This SOP was prepared by the Protective Force Training Department and is scheduled for annual review in March 2009.

8.3.2 Exercise Controllers: Responsible for the following:

- 8.3.2.1 Prior to training, inspect training or functional areas for which they are responsible for potential hazards.
- 8.3.2.2 Ensure that participants under their control have properly modified and marked ESS weapons and magazines, have appropriate ESS ammunition, and are wearing required PPE.

8.3.3 Safety Controller: Responsible for the following:

- 8.3.3.1 Inspect all exercise weapons, magazines, ammunition, and training aids.
- 8.3.3.2 Ensure ESS weapons, magazines, and ammunition are only issued to participants after they are in the ESS training area.
- 8.3.3.3 Ensure all persons, vehicles, and equipment entering the ESS training area are searched for live weapons and ammunition and other prohibited items.

8.3.4 Students/Role Players: Will not be permitted to load ESS firearms until instructed to do so by a Controller.

8.4 **Safety Briefing**

8.4.1 **Four General Firearms Safety Rules**

With ESS training firearms, there are obvious conflicts associated with applying the Four General Firearms Safety rules. However, to avoid injury to participants and ensure training safety, apply the four general safety rules.

- 8.4.1.1 All firearms are always loaded.
- 8.4.1.2 Never point the firearm at anything you are not willing to destroy.
- 8.4.1.3 Keep your finger off the trigger until your sights are on the target.
- 8.4.1.4 Be sure of your target.

8.4.2 **ESS Briefing**

- Only participants who have received training on ESS weapons, ammunition, and training safety requirements may participate in training involving ESS weapons.
- ESS weapons, magazines, and ammunition will only be issued in a pre-designated sanitized area.
- All participants, vehicles, and equipment will be inspected by Controllers for live weapons, live ammunition and other prohibited items prior to entering the sanitized area.

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- Each participant is expected to monitor his/her own physical condition for signs of overexertion or illness, and report negative conditions to a Controller.
- Participants using or handling explosive simulators must have appropriate training and wear required PPE.
- Participants may ascend or descend from elevated positions by ladder, stairs, or using approved urban ascent/descent techniques.
- No training is permitted on rooftops except in designated areas. Movements on approved rooftop fighting positions will be performed in a controlled manner, and participants will go no closer than 6 feet to the edge of a roof not equipped with fall protection.
- All required PPE must be worn during training.
- All injuries—no matter how slight—must be reported immediately to a Controller or the Paramedic.
- All posted signs and barriers must be obeyed.
- No live weapons or live ammunition can be mixed with ESS weapons and ammunition.
- Each person will inspect his/her weapons and magazines to ensure they are modified and marked for ESS use. Ammunition will be inspected to ensure no live rounds are present.
- No MILES firearm will be fired within 3 meters of another player. Participants must be cautious of hot gases vented from MILES weapons. No DMC weapon will be fired closer than 1 meter to another person.
- If engagement occurs closer than 3 meters with MILES weapons, the participant will announce “DANGER CLOSE” and will signify a “kill”.
- Participants will not stare directly into the beam of a transmitting laser on MILES equipment.
- Use of physical force, hand-to-hand combat, etc., will not be allowed. Players taken out of play will sit down in place, and place all weapons on the ground.
- In the event of an actual medical emergency, an announcement will be made with “MAYDAY MAYDAY MAYDAY”. The Exercise Director will suspend all activities, and emergency procedures will be initiated.
- If vehicles are used in training, all drivers must:
 - Obey laws related to vehicle operations.
 - Ensure all vehicle occupants wear safety belts, which are mandatory.
 - Not operate vehicle off roadways unless necessary for the exercise and with approval from ES&H staff and the Exercise Controller.

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- Prohibit individuals from riding on the outside of the vehicle.
- Report any damage to vehicles and equipment to instructors immediately.
- Accelerate, decelerate, turn, etc., in a safe manner.
- Prohibit mounting or dismounting the vehicle until it has come to a full stop with the transmission in park and the parking brake set.

8.4.3 Scenario Briefing

Prior to each training operation, participants will receive a briefing from the Senior Controller detailing the requirements of each scenario. Participants will be encouraged to ask questions to ensure their complete understanding of the training to be undertaken.

8.5 Personal Safety Requirements

8.5.1 Use the following PPE if participating in ESS training, which constitutes the manufacturer's minimum recommendation for PPE.

- A. Eye protection meeting the requirements of ANSI Z87.1-2003, with side shields or goggles;
- B. Hearing protection with a minimum noise reduction rating of 26; and
- C. Full face, head, and neck protection will be required when training with DMC weapons.

8.5.2 Use the following recommended (but not required) equipment for DMC training:

- A. Heavy clothing, including gloves to cover all exposed skin;
- B. Groin protection;
- C. Body armor; and
- D. Helmets with non-spring-loaded face shields.

8.5.3 During DMC training, maintain a minimum safe firing distance of 1 meter (3 feet) from another person.

8.6 Risk Analysis

8.6.1 Senior Controller: Prior to conducting ESS training, ensure an approved risk analysis report is in effect that identifies all potential hazards associated with the training and the necessary actions to eliminate the hazards or mitigate them to an acceptable level. If no risk analysis report exists, prepare one in accordance with NTC-SOP-531, *Risk Analysis*, and secure the required approvals.

8.6.2 ES&H Staff: Review the risk analysis report before each ESS training course to determine that all potential hazards have been identified and that adequate controls are being implemented. If these criteria have not been met, return the risk analysis report to the Senior Controller for revision.

8.6.3 Lead Instructor: Revise risk analysis reports annually, or when changes occur in ESS training.

NON-PROPRIETARY INFORMATION

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8.7 Authorized ESS Training Areas

- 8.7.1 An authorized ESS training area must be cordoned off and have a specified entry/exit point. A sign identifying the authorized training area and stating "NO LIVE AMMUNITION PAST THIS POINT" will be posted at the specified entry/exit point. The training area is monitored at all times by designated personnel. Chemical light sticks will be used to identify the authorized ESS training area at night.
- 8.7.2 Prior to ESS training, non-DOE agencies must prepare a request and exercise plan and forward them with any other supporting documentation (e.g., ESS qualifications, certifications, etc.) to the PFT Manager or ISSTEC Manager. The request must include a description of the activity, location(s) of the activity to be conducted, date(s) of training, ESS weapons to be used, and participants to be involved.

9.0 APPENDICES

- A – Safety
- B – Marking Systems Activities
- C – Rules of Engagement
- D – Engagement Simulations System Training Plan
- E – Command and Control
- F – Performance Test and Training Activities Planning
- G – ESS Safety Briefing
- H – ESS Controller Check List
- I – Training Safety Plan for Training and Exercises Using Engagement Simulation Systems (ESS)

NON-PROPRIETARY INFORMATION

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APPENDIX A – SAFETY

A.1 General Safety

- A.1.1 Safety is a major concern in any PT or training activity. Safety rules must be followed to minimize the potential for accidents/injuries during activities involving the use of ESS. Management, controllers, and participants must anticipate and react to unsafe situations. Realism must be achieved and safety must be considered in the actions of all participating personnel. Integrating realistic safety requirements into scenarios involving ESS enhances participant safety under both operational and ESS activities.
- A.1.2 All PTs and training activities must be governed by approved ESS exercise and training safety plans and procedures that specifically address safety issues while remaining consistent with realistic evaluation and training. Risk analyses must include procedures for any materials, equipment and/or operations that are identified as potential hazards during the conduct of any scenario. Safety plans must cover facility safety concerns specific to scenarios being conducted. Preparations must also be made to respond with appropriate medical assistance to situations that could occur.
- A.1.3 ESS PTs and training activities must be regulated by trained Controllers who have authority regarding safety. Controllers are responsible for ensuring that all operations are conducted safely. Controllers, students, and any exercise participant may stop an evaluation and/or training activity for safety reasons. Safety is paramount in exercise planning and execution.

A.2 Participant Responsibilities

The following paragraphs specifically address safety-related considerations that impact exercise personnel and/or equipment; however, they apply to all ESS activities. Personnel acting as adversary/opposition force (OPFOR) team and response force members must be briefed as to their individual responsibilities to include:

- (1) Avoiding hazardous areas;
- (2) Monitoring their own physical condition for signs of overexertion;
- (3) Watching for other participants who appear injured or otherwise are in need of assistance, and immediately ceasing ESS activities in order to render aid and notify a Controller;
- (4) Reporting injuries, regardless of severity, to the nearest Controller or safety representative;
- (5) Handling and using all ESS firearms and weapons safely as though they were live fire weapons;
- (6) Inspecting issued MILES weapons and blank ammunition to ensure that no live ammunition and the proper blank ammunition is present, and that the MILES weapons and magazines, where used, are properly color-coded;

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- (7) Inspecting issued DMC firearms and DMC ammunition to ensure that no live or blank-fire ammunition is present, and that the DMC firearms and magazines, where used, are properly color-coded;
- (8) Inspecting issued blank-fire firearms and blank ammunition to ensure that no live or DMC ammunition is present and that the blank-fire weapons, and magazines, where used, are properly color-coded;
- (9) Inspecting inert weapons to ensure that they are incapable of operation and to ensure that no ammunition is present and that they are properly color-coded;
- (10) Limiting physical contact, during an arrest scenario, to that force necessary for searching and handcuffing while refraining from violent physical contact;
- (11) Refraining from attempts to disarm a participant by grabbing their firearm or person;
- (12) Ascending or descending from elevated positions by ladder, stairs, or using approved urban ascent/descent techniques;
- (13) Avoiding hot propellant gases vented from weapons systems; and
- (14) Avoiding taking outdoor positions near the ESS Vehicle Hit Indicator System which contains an explosive charge.

NOTE: The ESS Vehicle Hit Indicator System is designed to simulate and react to firearms fire. Blasts are vented upwards and usually do not present a hazard. Participants must be careful not to position themselves above or within 10 feet of the device while outside a vehicle.

A.3 ESS Safety

- A.3.1 All firearms and weapons used in ESS exercises and training activities must be permanently modified and dedicated for ESS use only. The only permissible exceptions are the M-60, HK-21, FN M-249, and FN M-240 machine gun receivers. ESS modifications of these machine guns are limited to the barrel and feed tray, which gives them additional flexibility.
- A.3.2 With the exception of single shot grenade launchers, MILES firearms must be equipped with approved blank fire adapters or blast deflectors.
- A.3.3 Dedicated ESS firearms must not be reactivated for live-fire usage without the approval of the DOE cognizant security authority.
- A.3.4 All MILES firearms must be equipped with live-round inhibiting devices or ported chambers, plus one or more additional engineered layers of safety, to prevent the accidental introduction of live rounds.
- A.3.5 Only DMC firearms equipped with DMC conversion kits and DMC ammunition approved by the Office of Health, Safety and Security (HSS) may be used. All DMC conversion kits

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must be designed to inhibit live rounds from being chambered. If a factory “drop-in” kit is used to modify a firearm to use DMC, a DOE-certified armorer specifically trained in the installation of such a kit must accomplish the modification. DMC systems may be fired only at participants who are at least 1 meter away.

A.3.6 ESS firearms used in an exercise must be inspected by a DOE-certified armorer or Firearms Instructor prior to the beginning of the exercise, clearly marked as exercise firearms, closely controlled, and kept separate from any firearms not associated with the exercise. Approved color coding markings are:

- (a) orange for MILES and blank-fire firearms and magazines, clips, and belts (first link);
- (b) blue for DMC firearms and DMC magazines, clips, and belts (first link), and speed loaders;
- (c) blue and orange for MILES/DMC hybrid firearms; and
- (d) red for inert firearms and weapons.

A.3.7 ESS firearms must not be loaded until authorized by a Controller.

A.3.8 Blank ammunition must not be used in tactical exercises except with ESS equipment.

A.3.9 MILES firearms equipped with blank fire adapters or blast deflectors may be fired only at participants who are at least 10 feet away.

A.3.10 Maintenance and adjustments to laser transmitters must be performed only by the supplier or by qualified technicians approved by the supplier.

A.3.11 ESS firearms must be cleaned after each exercise, and, if malfunctioning or damaged, repaired or removed from service.

A.3.12 All ESS firearms must be inspected by a DOE-certified armorer and certified at least every 12 months. Requirements for certification as a DOE armorer are contained in Section B, Chapter IV, paragraph 4.a. All engineered layers of safety incorporated in an ESS weapon also must be inspected.

A.4 ESS Ammunition and Blank-Fire Adapters

A.4.1 Only blank ammunition magazines, clips, and belts (first link) that have been distinctively color-coded orange and modified for use with an ESS firearm may be used. The ESS magazine, clip, or belt when used in conjunction with a modified ESS firearm must prevent the inadvertent feeding and chambering of a live round. Caution must be exercised because a live round can be placed in the lip of some firearm magazines.

A.4.2 Only DMC ammunition magazines, clips, and belts that have been distinctively color-coded may be used. Caution must be exercised because a live round can be placed in a DMC magazine lip, or in some cases a DMC magazine can be fully loaded with live ammunition.

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- A.4.3 Blank and DMC ammunition must be stored separately from live ammunition and from each other, either in a different location or in a locked cabinet, and must be inspected prior to issuance by a controller or instructor.
- A.4.4 Prior to each ESS training activity and at the beginning of each scenario:
- (a) Participants must inspect their firearms and person to ensure that only the proper exercise ammunition (e.g., blank ammunition for MILES and DMC ammunition for DMC exercises) and properly equipped MILES and/or DMC firearms are in use; and
 - (b) Each firearm and all ammunition must be inspected by the responsible ESS controller/instructor to ensure that only the proper ammunition and properly equipped ESS are in use.
- A.4.5 Manufacturers' recommendations for shelf life of DMC must be followed.
- A.4.6 LAWs/Rocket Propelled Grenades (RPGs), VIPERS.
- (a) LAWs/RPGs/VIPERS must not be cocked until the target is identified. If the simulator is not fired at a given target but is anticipated to be fired at another target during the exercise, it must be returned to the uncocked position until the target is sighted. If the simulator is not fired, it must be returned to an unloaded/tube empty position prior to turn-in.
 - (b) LAWs/RPGs/VIPERS must be used only in designated areas.
 - (c) LAWs/RPGs/VIPERS must be used only for training purposes when exclusion distances and conditions are established as though an actual LAW was being fired. The exclusion distance for the LAW/RPG/VIPER is 5 feet to either side and 30 feet to the rear.

A.5 Pyrotechnics, Flash-Sound Diversionary Devices, and Chemical Agents

ATTENTION: Until the DOE moratorium on the use of smoke is lifted, the use of smoke- and obscurant-generating pyrotechnics is prohibited at the NTC.

- A.5.1 Participants must never pick up thrown pyrotechnics, flash-sound diversionary devices, or chemical agents (even those that appear to be duds). Duds must be reported, as soon as possible after discovery, to the Senior Controller.
- A.5.2 Written and approved procedures for handling duds and expended devices must be included in approved exercise and lesson plans. These plans and procedures must follow the manufacturer's disposal recommendations or site-approved procedures and must be implemented by properly trained personnel.
- A.5.3 Written and approved procedures for activities such as the wiring of pyrotechnics into vehicle electrical systems and the use of booby traps and trip wires must be included or referenced in ESS exercise plans and procedures. These activities must follow manufacturer's recommendations or site-approved procedures and must be conducted by properly trained personnel.

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A.6 Vehicle Safety

The following requirements apply to the use of vehicles during an exercise:

- A.6.1 Vehicles must not be mounted or dismounted until after they come to a complete stop.
- A.6.2 All personnel in moving vehicles must wear seat belts at all times. Passengers may ride in the back of moving open vehicles provided that restraint devices are installed and used and they remain seated within the vehicle.
- A.6.3 Vehicle maneuvers (e.g., accelerations and decelerations, cruising, turns, etc.) must be accomplished in accordance with local vehicle operating procedures.
- A.6.4 When an exercise scenario requires a roadblock, it will be simulated by placing a blocking vehicle on the shoulder of the road and by ensuring that a controller is notified that a roadblock has been established. If the blocking vehicle's presence could effectively obstruct the roadway, the controller should not allow the vehicle being blocked to pass.
- A.6.5 During scenario play depicting normal site operations, posted speed limits must be observed during the exercise and must not exceed either 25 miles per hour in the controlled exercise area or a lower speed limit set by the Senior Controller.

A.7 Rules of Engagement

Specific ROE must be developed and documented for each force-on-force or man-on-man PT/training activity, as applicable.

NON-PROPRIETARY INFORMATION

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APPENDIX B – MARKING SYSTEMS ACTIVITIES

B.1 General Requirements

- B.1.1 All DMC PTs must be monitored by a Controller who is a Department of Energy (DOE) National Training Center (NTC)-certified Firearms Instructor or has received specialized training.
- B.1.2 All DMC training activities must be conducted by an NTC-certified Firearms Instructor.
- B.1.3 Instructor/controller-to-shooter ratios will be dictated by the type of training/PT scenario. Participants must be familiar with the DMC firearms system to be used in the PT or training activity.

B.2 Safety Considerations

In addition to the safety considerations described in Appendix A, the following safety considerations specific to DMC activities must be included in training or PT activities which utilize DMC.

- B.2.1 DMC ammunition velocity could exceed the American National Standards Institute (ANSI) Z87.1 standard so protective eye wear must be ANSI or manufacturers' specification whichever is more stringent.
- B.2.2 All DMC equipment must be maintained and tested in accordance with manufacturer specifications.
- B.2.3 All DMC personal protective equipment (PPE) must be visually inspected prior to each use.
- B.2.4 Helmets with spring loaded face shields must not be used during DMC activities.
- B.2.5 DMC will not normally break vehicle glass that does not have defects or prior damage. However, if the glass is already cracked, a DMC round may break it. Repeated or rapid fire on undamaged plastic or glass may cause breakage. DMC may dent soft building materials including drywall, plywood, paneling, and hollow core doors; however, they will generally not penetrate them.
- B.2.6 Wearing clothes with a tight-weave fabric, such as that in military-type/field uniforms or coveralls, is required to cover and protect any exposed skin.
- B.2.7 If body armor is used, it must be dedicated for DMC use only.
- B.2.8 Testing of face and eye protection equipment by subjecting it to firing of DMC projectiles from the actual DMC firearms to be used is recommended. Testing must also include concentrated full automatic fire when such firearms are to be used. For information purposes, the manufacturer of the Avon protective mask recommends that outserts be used on the lenses of its masks when used in DMC exercises.
- B.2.9 DMC systems must not be fired at personnel closer than 1 meter (3.28 feet).

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- B.2.10 DMC ammunition must not be fired in standard, non-DMC modified firearms because plastic cartridge components could stick in the bore, causing a safety hazard.
- B.2.11 Blank ammunition must not be fired in DMC firearms due to potential hazards from muzzle gasses and ejected material.
- B.2.12 Face protection must provide protection from DMC projectiles entering under the face mask when the wearer tilts his/her head back or looks upward.

B.3 Ammunition and Firearms Conversion Kits

- B.3.1 Only DMC firearms equipped with conversion kits and ammunition approved by the DOE cognizant security authority may be used.
- B.3.2 All DMC firearms must be distinctively color-coded blue.
- B.3.3 All DMC firearms conversion kits must be designed to inhibit live rounds from being chambered.
- B.3.4 DMC ammunition must be used in accordance with the manufacturer's recommendations for storage conditions and shelf life. The marking compound in DMC may solidify and harden in older ammunition. Poor marking performance may also be encountered with older DMC ammunition. Personnel may have increased risk of potential injury from DMC ammunition projectiles if the marking compound becomes hardened through age or is used in cold temperatures.

B.4 Personal Safety Requirements

- B.4.1 Use the following PPE if participating in ESS training, which constitutes the manufacturer's minimum recommendation for PPE.
 - A. Eye protection meeting the requirements of ANSI Z87.1-2003, with side shields or goggles;
 - B. Hearing protection with a minimum noise reduction rating of 26; and
 - C. Full face, head, and neck protection will be required when training with DMC weapons.
- B.4.2 Use the following recommended (but not required) equipment for DMC training:
 - A. Heavy clothing, including gloves to cover all exposed skin;
 - B. Groin protection;
 - C. Body armor; and
 - D. Helmets with non-spring-loaded face shields.
- B.4.3 During DMC training, maintain a minimum safe firing distance of 1 meter (3 feet) from another person.

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B.5 Target Training

- B.5.1 Training may be conducted using DMC systems to fire at training targets such as the DOE TQ-15, decisional targets, or other targets. Such training does not involve force-on-force or one-on-one activities.
- B.5.2 Use of DMC systems for shooting training targets must follow the requirements of DOE M 470.4-3, Chg 1 [or current]), and normal live-fire safety procedures. Sites must evaluate the need for numbers and types of controllers and other exercise personnel based on the specific location and training to be performed.
- B.5.3 Provisions of DMC training plans, controller staffing plans, procedures, and risk assessments must address protection of uninvolved persons. They include observers and others who might become exposed to hazards of DMC if training targets are to be used in areas where uninvolved persons could be exposed. Potential hazards must be addressed related to using DMC systems for PFTD PTs and training involving activities such as team movement, close quarters battle, breaching training, room entries, live-fire shoot house, and officer survival activities.

NON-PROPRIETARY INFORMATION

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APPENDIX C – RULES OF ENGAGEMENT

C.1 Safety

Safety is a major concern in any ESS PT, and training activity and safety rules must be followed to minimize the potential for accidents and injuries during these activities. Management, participants, and controllers must caution and prepare participants to anticipate and react to unsafe situations. Realism must be achieved and safety must be considered in the actions of all participating personnel. Preparations must also be made to react with appropriate levels of medical assistance to situations that could occur.

C.2 Halting an Engagement Simulation Systems Activity

An ESS exercise or training activity may be halted at any time for safety, emergency, real-time security events, or administrative reasons.

- (1) Exercise Freeze. A command that is used to halt an exercise when it is necessary to correct safety-related problems or respond to an emergency.
 - (a) Any person observing a safety problem must announce “Exercise Freeze.”
 - (b) Controllers/Evaluators must relay the Exercise Freeze announcement throughout the PT area.
 - (c) Every participant must immediately freeze in place (i.e., stop at their locations and cease fire, movement, communication, and any other action) until the command “Resume Exercise” is given by the Exercise Director or Senior Controller at the direction of the Exercise Director.
- (2) Administrative Hold. The command “Administrative Hold” is used to halt an ESS exercise when it is necessary to correct exercise problems of an administrative or procedural nature. The use of the command may be planned when it is necessary to put a temporary hold on activities to set the stage for continuation of the exercise (e.g., change scenarios, operations shift change activities, etc.).
 - (a) The effect of an “Administrative Hold” can be limited to a specific location(s) or activity, or the entire exercise.
 - (b) The command “Administrative Hold” must not be called to correct safety problems or respond to emergencies.
 - (c) Only a controller can administratively halt exercise activities. The controller will announce the hold in the affected area and all participant activity in that area will immediately halt until the controller gives the command “Resume Exercise.”

C.3 Participants

- (1) Pre-Exercise Activities:

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- (a) All pre-exercise actions must be conducted in accordance with normal operating procedures. Participants must be closely monitored to ensure they do not use artificially generated factors to affect the outcome of the PT.
- (b) Participants must be familiar with the operation of issued ESS equipment.
- (c) Participants who will be using or handling pyrotechnics, diversionary devices, hazardous materials, or electrical or mechanical equipment must receive training in their proper use, in accordance with current applicable requirements.
- (d) Before being assigned to act as hostage(s)/role players, individuals must be asked if they are willing and capable of dealing with the isolation and demands of a hostage/barricade situation.
- (e) Participating non-DOE law enforcement and other emergency personnel must be instructed how to react in accordance with PT plans and safety and health requirements.
- (f) All players and participants must be physically capable of participating without undue risk of injury to themselves or others.

(2) Safety:

- (a) No attempt will be made to disarm an adversary by forcibly taking an ESS weapon.
- (b) All ascents to, or descents from, elevated positions must be by ladder, stairs, or other approved methods.
- (c) No person acting in the role of a hostage may be abused.
- (d) Event Controllers must ensure all occupants of the facility are moved into a safe area during assault phases, and are provided with appropriate PPE and safety equipment.

(3) Injuries:

- (a) All injuries must be reported immediately to the nearest controller. Anyone observing an injured or ill participant must immediately advise the nearest controller.
- (b) The command "Exercise Freeze" must be used in communications in the event a hostage/role player or other participant becomes injured or ill. If a problem arises during hostage scenario events it must be brought to the attention of a controller immediately.

(4) Damages: Any damage to vehicles and equipment must be reported to a controller no later than the termination of the PT.

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(5) Elimination:

- (a) Once eliminated under the ROE and/or per scenario-specific requirements, a participant must immediately cease fire, movement, communication, and all other actions. Location permitting, eliminated participants must be prone or seated, and weapons grounded to ensure they do not impact scenario/exercise actions. The responsible controller may remove an eliminated participant from the area for safety and operational reasons. Eliminated participants must remain in place until they are released by a controller.
- (b) Participants occupying vehicles must be instructed on the provisions for vehicle and vehicle occupant casualties, including the number of allowed survivors based on the type of weapon hit(s) received.
- (c) No physical contact is allowed with eliminated participants except to search and secure (apply restraints), if applicable to the scenario. An eliminated OPFOR or PF participant may be approached to obtain radios or other equipment. ESS firearms and ammunition may be seized and utilized by other participants only when a controller is present to ensure that the seized ESS firearms and ammunition are used safely. The controller must ensure that the seized ESS weapon is returned to the participant to whom it is assigned for accountability purposes.
- (d) Persons deliberately attempting to circumvent the ROE or gain an unfair advantage by using any unrealistic tactic or action (e.g., covering MILES sensors, hiding behind false cover, removing headbands, etc.) will be immediately eliminated by a controller. All vehicles not involved in PT play (air, land, or water craft) that will be operated in the PT area must be conspicuously identified and the identification methods must be included in participant briefings.

C.4 Vehicles

(1) Safety:

- (a) Vehicles that will be used in the exercise must be identified clearly as exercise vehicles. All participants are restricted from using vehicles other than those outfitted with ESS equipment and/or designated for exercise use.
- (b) All vehicles must be operated safely. Drivers must observe all site requirements and applicable laws relating to vehicle operation. The wearing of safety belts is mandatory for all vehicle occupants. No vehicle will be operated off roadways unless necessary for scenario action and there has been prior approval by the responsible controller.
- (c) During scenario play depicting normal site operations, posted speed limits must be observed during the exercise and must not exceed either 25 miles per hour in the controlled exercise area or a lower speed limit set by the Senior Controller. Vehicles responding to real-world site emergencies and security incidents during Exercise Freeze conditions will be operated at speed limits per approved response plans.

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- (d) Except for normal passing, no vehicle may be driven closer to another vehicle than the distance permitted by the two-second rule. Following a normal pass, the passing vehicle must immediately reduce speed to the posted speed limit.
 - (e) Impassable roadblocks will be indicated by placing yellow engineer tape, orange cones, flags, etc., on or across the roadway, per approved PT plans/procedures.
 - (f) Emergency vehicles are not part of the exercise unless equipped with ESS equipment.
- (2) Elimination: Exercise plans/procedures must include requirements to determine the elimination of exercise vehicles. Requirements should include the use of MILES vehicle hit indicator harnesses and controller calls.

C.5 Explosives and Pyrotechnics

- (1) Organizations using explosives and pyrotechnics must provide safe operating procedures to the safety controller. These procedures must identify the hazards and required training, assess the risks, and establish the necessary safety requirements for the particular operation.
- (2) Explosives and pyrotechnics must be employed commensurate with the applicable requirements of DOE O 440.1A, Worker Protection Management for DOE Federal and Contractor Employees, and DOE M 440.1-1, DOE Explosives Safety Manual.
- (3) Pyrotechnics and explosives must be used by the OPFOR, Special Response Teams (SRTs), or other personnel only as authorized by the DOE cognizant security authority. Personnel must be trained in the use of deployed explosives and pyrotechnics and in the respective safety requirements. Quantities of, and locations for, explosives and pyrotechnics to be utilized during the PT must conform to approved response plans and be reviewed and approved by the Senior Controller and the Safety Controller prior to use.
- (4) ESS Pyrotechnics:
 - (a) Electrical explosives in an ESS explosive simulator device are directed upward and slightly to the rear of this device. The safety zone around these devices is 10 feet.
 - (b) Participants firing an ESS LAW/RPG/VIPER must ensure that the area 30 feet behind and 5 feet to each side of the weapon is clear. Personnel in the exercise area must also be briefed to not approach closer than 30 feet directly behind any participant firing a LAW/RPG/VIPER. LAWs can be made safe by depressing the safety rod that is on the top rear of the weapon.
 - (c) Vehicle system electrical explosive charges are mounted on the opposite side from the color indicator light. Since these devices are usually mounted on the vehicle roof with the blast directed upward, they normally do not present a

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hazard. However, there may be selected special applications where the device is mounted on a vehicle bumper or hood. In these situations, participants must be careful not to position themselves above or within 10 feet of the explosive holder.

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APPENDIX D – ESS TRAINING PLAN

D.1 Objectives

The ESS training plan objective(s) must be stated succinctly. This will consist of a concise statement of the goal(s), such as to evaluate against established requirements, to enhance preparedness through training, and/or to evaluate potential upgrades to systems or equipment.

D.2 Scenario Description

- a. Describe the Threat Scenario. Define the target and the threat to provide an understanding of the nature of the exercise. Specific information in this area may be classified .
- b. Describe the Facility(ies) Involved. Establish the exercise boundaries and provide clear indication of the exercise area, the facilities involved, and out-of-bounds areas/limits.
- c. Define the Required PF Response. Provide a description of the desired PF response to adversarial actions. This may entail citing the applicable existing response plan or a standing operating procedure. Specific information may be classified.
- d. Establish the Schedule. Define PT initiation, time/date, and schedule of events. Specific information in this area may be classified.

D.3 Test Methodology

- a. State how the exercise/validation will be conducted.
- b. Identify the number of PT, exercise and/or event iterations to be conducted.
- c. Identify required pre/post-exercise briefings.
- d. Establish pass/fail criteria (e.g., statistical model, test criteria, mathematical formulas, or methods, lesson plans, as applicable).

D.4 Test Control

Identify exercise control measures.

- a. Establish the PT control chain of command.
- b. Describe controller responsibilities specific to the PT/exercise/scenario.
- c. Describe non-participant (observer) controls.
- d. Describe PT and emergency communications systems.
- e. Describe accountability and control of ESS and live-fire firearms and ammunition.

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D.5 Resource Requirements

Identify resources necessary to control and conduct the exercise.

- a. Participants:
 - 1. Opposing Force (OPFOR)
 - 2. Fixed PF posts
 - 3. SRT
 - 4. Mobile PF units
 - 5. Local Law Enforcement Agency(ies) (LLEA) units
- b. Logistics:
 - 1. Equipment
 - a. Firearms
 - b. Vehicles
 - c. Communications
 - 2. Supplies
 - 3. Safety/health

D.6 Training Requirements

- a. Describe prerequisite training for PF, OPFOR, and role players (e.g. SPO-I, -II, or -III qualified, or scenario-specific training).
- b. Describe prerequisite training required for controllers
- c. Entries in definitions lists in the main body of directives must conform to the standard directive style/format.

D.7 Exercise Coordination Requirements

Describe all organization coordination requirements.

- a. Continuation of Operations:
 - 1 Operations area(s)
 - 2 Building/area occupancy
- b. Safety and Health Oversight and Support:
 - 1 Emergency medical
 - 2 Fire department
 - 3 Radiation protection
 - 4 Appropriate population notification
- c. Essential LLEAs
- d. Opposition Force Coordination:
 - 1 Arrange OPFOR team lodging, vehicle support, and other logistical requirements.
 - 2 Develop mission order for use in tactical planning.
 - 3 Develop scenario-based training schedule.

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- 4 Negotiate weapons effects for vehicles and/or structures that cannot be MILES-harnessed.
- 5 Coordinate OPFOR controller assignments.

D.8 Compensatory Measures

Describe any compensatory measures required during the PT.

D.9 Safe Exercise Halt Procedures

- a. Actual alarm response.
- b. Response into exercise area (treatment, handling, and evacuation of injured during actual emergencies and accidents).
 - 1 Operational anomalies
 - 2 Administrative hold
 - 3 Exercise freeze
 - 4 Weather

D.10 End of Exercise Accountability

- a. Personnel
- b. Firearms
- c. Equipment

D.11 Coordination and Approval

Review and/or sign off (concurrence), as applicable:

- a. PF management
- b. Facility Security Officer
- c. Environment, Safety and Health (e.g., Facility Representative)

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APPENDIX E – COMMAND AND CONTROL

This references the criteria found in DOE Order 470.4-3, Chg 1 (or current) and applies to the performance test/training conducted at the NTC LFR.

E.1 Command and Control System

A system of command and control must ensure that ESS safety and other requirements of DOE Manual 470.4-3 Chg 1 (or current version), *Protective Force*, and this SOP are met and maintain an environment free of the recognized risks associated with conducting certain PTs and training activities. The command and control system must ensure that rules of engagement (ROE) are followed, specific hazards and safety concerns, as identified in a risk assessment, are appropriately addressed, and exercise continuity is maintained. The command and control system is dependent on a contingent of personnel selected and specifically trained to control ESS PT/training exercises.

E.2 Command and Control Responsibilities

The controller staff must be organized in a manner that facilitates the control of all affected locations and the control and coordination of all events to be initiated during the exercise. Individual controllers may have several duties assigned depending on where they are and what activities are occurring in their areas of responsibility. **Their first and foremost responsibility is ensuring safety during exercise activities.** This includes ensuring all participants adhere to the safety procedures and ROE. Event controllers at a particular exercise location are responsible for ensuring that prompt action is taken in accordance with established safety procedures to prevent accidents or unsafe conditions. Controllers are responsible for enforcing or implementing the following requirements during exercises:

- (1) Conducting safety checks and inspections of all personnel under their control for live rounds or other prohibited ammunition in DMC (DMC) or MILES PTs/exercises. No DMC rounds allowed in MILES exercises unless using approved hybrid ESS weapons. Safety checks and inspections should also be conducted for other prohibited articles and for general safety. The results of these checks and inspections must be reported to the Senior Controller prior to the initiation of the PT.
- (2) Ensuring no live firearms or ammunition of any type is allowed within the ESS PT/training exercise area.
- (3) Ensuring PT participants and observers wear and use appropriate safety equipment.
- (4) Ensuring that personnel under their control comply with the PT plan to include the ROE and the safety regulations.
- (5) Ensuring that ESS firearms handling and manipulation procedures comply, or are compatible, with procedures for live-fire training/operations.
- (6) Terminating a specific activity or the entire PT if unsafe conditions or acts are observed.

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- (7) Ensuring the accountability of personnel and equipment at the termination of the PT and reporting the results to the Senior Controller.

E.3 Command and Control Positions

Every force-on-force PT and related activity must be regulated by controllers under the supervision of an Exercise Director, who is responsible for overall control of the PT. The Exercise Director must be supported by a Senior Controller, a Safety Controller, an ESS Controller, and follow-up for any lessons learned.

(1) The Exercise Director:

- (a) Is responsible for assuring that all appropriate safety and S&S measures are in place prior to the start of, and during, the exercise;
- (b) Is responsible for signaling the beginning and end of exercises, and for guiding and supervising the other controllers;
- (c) Has final authority for exercise halts due to potential safety or S&S concerns; and
- (d) Should have a counterpart management official when operational facilities are the site of the exercise.

(2) Senior Controller: The Senior Controller reports directly to the Exercise Director and is responsible for coordinating, establishing, and supervising the exercise controller staff; identifying the number of personnel required to control the exercise; ensuring that appropriate controller training is conducted; and developing and implementing the concept of operation for the Exercise Director. The Senior Controller ensures:

- (a) All controllers have attended on-site pre-exercise controller training and scenario orientation;
- (b) A sufficient number of technically qualified controllers are available to support each exercise event;
- (c) All participant groups, as determined by the Exercise Director, are thoroughly briefed on their respective exercise scenarios, ROE, safety concerns, emergency procedures, medical response, munitions and firearms safety, and vehicle and personnel safety; and
- (d) Exercise debriefings are conducted and documented:
 - 1 Controllers understand their responsibilities in support of exercise documentation; and
 - 2 Controller debriefings are coordinated and documented.
- (e) OPFOR personnel from other sites, locations or agencies:
 - 1 Receive training on site-specific procedures for ESS exercises, and safety and health protection; and

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- 2 Participate in safety walk downs of the exercise area as permissible and required.
- (3) Safety Controller: The Safety Controller is responsible for assessing the PT plan and ensuring that walk-downs of the exercise area and safety briefings are conducted. The Safety Controller also ensures that safety briefings specify the ROE, medical response, munitions and firearms safety, and vehicle and personnel safety. The Safety Controller provides support to the Senior Controller and must remain in contact with the Senior Controller at all times during the exercise. In addition, the Safety Controller:
 - (a) Assists the Senior Controller in the development and conduct of pre-PT controller training;
 - (b) Ensures that adequate safety walk-downs are conducted to determine site suitability prior to the PT;
 - (c) Ensures that identified controllers are required to go on each safety walk-down;
 - (d) Verifies that all required personnel are present for each safety walk-down;
 - (e) Conducts a safety walk-down of the PT area with the Exercise Director, Senior Controller, Event Controllers, and other selected controllers (as appropriate) prior to the exercise; and
 - (f) Coordinates with emergency management personnel to ensure emergency medical and fire protection services will be present or on call for the duration of the PT.
- (4) ESS Controller: In PTs involving the use of ESS equipment, the ESS Controller is responsible for:
 - (a) Issuing and accounting for all ESS firearms, weapons, and support equipment;
 - (b) Inspecting all ESS ammunition to be utilized prior to issue;
 - (c) Testing the ESS equipment for operability in conjunction with the firearm prior to PT commencement; and
 - (d) Collecting all ESS firearms and ammunition, and pyrotechnics at the conclusion of the PT.
- (5) Opposition Force (OPFOR) Controller: The OPFOR Controller must possess sufficient tactical expertise, knowledge, and physical ability to ensure that his/her presence does not interfere with, or hamper the actions of, the OPFOR in completing planned scenario actions. The OPFOR Controller is responsible for ensuring:
 - (a) Voice communications are established and maintained with the Senior Controller throughout the course of the PT; and

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- (b) The OPFOR adheres to the ROE and planned scenario(s) actions.
- (6) Event Controllers: Event Controllers report to the Senior Controller and are responsible for executing control over specific categories of PT activity, including one or more events. Event Controllers are responsible to ensure nonparticipating facility personnel in the PT area are aware that an exercise is to be conducted and that they are not to interfere with the flow of the exercise. Event Controllers must ensure that all PT participants under their control:
- (a) Are aware of procedures for halting a PT for safety reasons or for an actual emergency;
 - (b) Are not in possession of any live firearms or ammunition;
 - (c) As applicable, have been provided with instruction on the hazards of Light Anti-Tank Weapon (LAW) simulators and any personnel using a LAW simulator have received comprehensive instruction on its usage prior to PT initiation;
 - (d) Have operable communications equipment;
 - (e) Are fully trained and qualified if assigned responsibilities to deploy hand-thrown pyrotechnics, flash-sound diversionary devices, and/or chemical agents; and
 - (f) Are instructed that full-charge flash-sound diversionary devices must not be deployed into occupied areas or rooms and that the minimum distance they may be deployed near personnel in open areas must be consistent with the specific pyrotechnic technical data sheet or Material Safety Data Sheet (MSDS), in no case less than 50 feet. Sub-charge flash-sound diversionary devices may be deployed into occupied areas or rooms with the approval of the appropriate safety organization.
- (7) Evaluators: Evaluators are PT observers with responsibility to record the PT progress, the actions of participants, and the results of actions. Evaluator observations are used to determine exercise results. Controllers may also be tasked to conduct evaluation duties. Evaluators are responsible to stop PT activities for safety reasons.
- (8) Controller and Evaluator Training: The command and control system depends on a contingent of personnel selected and specifically trained to control ESS PT/training exercises. In addition to being trained to oversee exercises, controllers must receive training commensurate with the scope, complexity, and special nature of the activity. Based on the nature and complexity of the PT, specific controllers may be required for the ESS equipment issue and accountability, occupational safety and health, and special or high-risk activities (e.g., LAWs, explosive breaching, pyrotechnics, rappelling, etc.). Evaluators must receive controller training in order to perform evaluation duties.
- (1) Formal Training. All personnel assigned controller or evaluator duties must receive formal documented training for the safe conduct of a PT. The controller

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and evaluator training program must be approved by the DOE cognizant security authority and must include the following topics.

- (a) Controllers and Evaluators:
 - 1 Purpose
 - 2 Responsibilities
 - 3 Duties
- (b) General Knowledge Requirements:
 - 1 ESS equipment/pyrotechnics
 - 2 ESS weapons versus comparable live-fire weapons capabilities
 - 3 Safety
 - a. Firearms
 - b. Vehicle use
 - c. Participants
 - d. Environment, Safety, and Health
 - e. Medical
 - 4 Exercise Plans:
 - a. Schedules
 - b. Scenarios/scenario variables, as applicable
 - c. Required PF actions
 - d. OPFOR actions, as applicable
 - e. Required and assigned controller/evaluator actions, as applicable
 - f. Role player actions, as applicable
 - g. Administrative hold/exercise freeze or termination
 - h. ROE
 - i. Communications
 - j. Administration
 - k. Security
- (2) PT Scenario-Specific Briefings: In addition to the formal training discussed above, controllers/evaluators must receive PT and scenario specific briefings prior to each PT. These briefings must include:
 - (a) Individual specific tasks and responsibilities prior to PT initiation;
 - (b) Procedures for the following: Exercise Freeze, Administrative Hold, ROE for participants, vehicle safety, vehicle kills, explosives, firearms and ammunition, ESS, general safety, and actual emergencies and security incidents;
 - (c) Description and demonstration of the desired method for recording information about the events that transpire during the PT;
 - (d) Planned simulations/artificialities, how they will affect the PT, when they will be injected, and the procedures for formulating and introducing other simulations/artificialities, as needed, after PT initiation;
 - (e) Transportation arrangements for controllers, exercise participants, data collectors, and observers to the PT location and during PT activities;

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- (f) Purpose of the after action meeting, the information that should be brought to the meeting, and the location for the meeting;
- (g) Location for the issue and turn in of equipment, accountability measures, and detailed instructions on the equipment required for each controller during the PT;
- (h) Detailed description and demonstration of the radios the controllers operate during the PT. Explain the importance of operating only on the channel and frequency specified in the communications plan;
- (i) Detailed briefings and demonstrations, as appropriate, on each piece of ESS equipment to be used in the PT and how and where it will utilized;
- (j) Map(s) depicting the route to the PT area and conduct a walk-down with all controllers/evaluators, as necessary;
- (k) PT emergency procedures;
- (l) Guidelines for information control and established policies and procedures for the protection of PT related classified information, and unclassified controlled information;
- (m) Methodology for identifying controllers/evaluators and donning and wearing of any apparel to be used for identification purposes, as applicable; and
- (n) Directions to, and scheduled time(s) for, controller/evaluator meetings.

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APPENDIX F – PERFORMANCE TEST AND TRAINING ACTIVITIES PLANNING

This references the criteria found in DOE Order 470.4-3, Chg 1 (or current) and applies to the performance test/training conducted at the NTC LFR.

F.1 Performance Test and Training Activity Plans

The Performance Test (PT) plan and training activity plan (or lesson plan, procedures, etc.) must define the scenario/activity and the exercise/training area in sufficient detail to allow a valid hazard assessment to be performed. The following additional information must be included in a PT/training plan involving the use of ESS, as applicable:

- (1) Personnel safety and health requirements;
- (2) Vehicle safety;
- (3) Storage, handling, and the safe use of firearms, ammunition, and ESS equipment;
- (4) Facility security; and
- (5) Other applicable considerations which may be necessary as identified in the governing risk assessment(s).

NOTE: Where applicable, approved safety and ESS procedures may be referenced in the PT plan and training plan and are not required to be restated in their entirety unless required by local implementing procedures.

F.2 Force-on-Force Exercise Plans

The following areas must be considered and included, as applicable, in the development of a typical force-on-force plan or for an LSPT involving the use of ESS.

- (1) Objective(s). The objective(s) must be stated succinctly. This will consist of a concise statement of the goal(s), such as to evaluate against established requirements, to enhance preparedness through training, and/or to evaluate potential upgrades to systems or equipment.
- (2) Scenario Description
 - (a) Describe the Threat Scenario. Define the target and the threat to provide an understanding of the nature of the exercise. Specific information in this area may be classified.
 - (b) Describe the Facility(ies) Involved. Establish the exercise boundaries and provide clear indication of the exercise area, the facilities involved, and out-of-bounds areas/limits.
 - (c) Define the Required PF Response. Provide a description of the desired PF response to adversarial actions. This may entail citing the applicable existing

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response plan or a standing operating procedure. Specific information may be classified.

- (d) Establish the Schedule. Define PT initiation, time/date, and schedule of events. Specific information in this area may be classified.

(3) Test Methodology

- (a) State how the exercise/validation will be conducted.
- (b) Identify the number of PT, exercise and/or event iterations to be conducted.
- (c) Identify required pre/post-exercise briefings.
- (d) Establish pass/fail criteria (e.g., statistical model, test criteria, mathematical formulas, or methods, lesson plans, as applicable).

(4) Test Control. Identify exercise control measures.

- (a) Establish the PT control chain of command.
- (b) Describe controller responsibilities specific to the PT/exercise/scenario.
- (c) Describe non-participant (observer) controls.
- (d) Describe PT and emergency communications systems.
- (e) Describe accountability and control of ESS and live-fire firearms and ammunition.

(5) Resource Requirements. Identify resources necessary to control and conduct the exercise.

- (a) Participants.
 - 1. Opposing Force (OPFOR).
 - 2. Fixed PF posts.
 - 3. SRT.
 - 4. Mobile PF units.
 - 5. Local Law Enforcement Agency(ies) (LLEA) units.
- (b) Logistics.
 - 1. Equipment
 - a. Firearms.
 - b. Vehicles.
 - c. Communications.
 - 2. Supplies.
 - 3. Safety/health.

(6) Training Requirements.

- (a) Describe prerequisite training for PF, OPFOR, and role players (e.g., SPO-I, -II, or -III qualified, or scenario-specific training).

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- (b) Describe prerequisite training required for controllers.
- (7) Exercise Coordination Requirement. Describe all organization coordination requirements.
 - (a) Continuation of Operations.
 - 1. Operations area(s).
 - 2. Building/area occupancy.
 - (b) Safety and Health Oversight and Support.
 - 1. Emergency medical.
 - 2. Fire department.
 - 3. Radiation protection.
 - 4. Appropriate population notification.
 - (c) Essential LLEAs.
 - (d) Opposition Force Coordination.
 - 1. Arrange OPFOR team lodging, vehicle support, and other logistical requirements.
 - 2. Develop mission order for use in tactical planning.
 - 3. Develop scenario-based training schedule.
 - 4. Negotiate weapons effects for vehicles and/or structures that cannot be MILES-harnessed.
 - 5. Coordinate OPFOR controller assignments.
- (8) Compensatory Measures. Describe any compensatory measures required during the PT.
- (9) Safe Exercise Halt Procedures.
 - (a) Actual alarm response.
 - (b) Response into exercise area (treatment, handling, and evacuation of injured during actual emergencies and accidents).
 - 1. Operational anomalies.
 - 2. Administrative Hold.
 - 3. Exercise Freeze.
 - 4. Weather.
- (10) End of Exercise Accountability.
 - (a) Personnel.
 - (b) Firearms.
 - (c) Equipment.
- (11) Radiation Monitoring.
- (12) Coordination and Approval. Review and/or sign off (concurrence), as applicable.

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- (a) PF management.
- (b) Facility Security Officer.
- (c) Environment, Safety and Health (e.g., Facility Representative).

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APPENDIX G – ESS SAFETY BRIEFING**UNITED STATES
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ESS SAFETY BRIEFING

- Only students who have received ESS training and have received the safety briefing can participate in training involving ESS weapons.
- ESS weapons will be issued in a pre-designated sanitized area only.
- All participants and equipment will be inspected by instructors for any live ammunition or weapons prior to entering the sanitized issue area.
- Each participant must monitor his/her own physical condition for signs of overexertion.
- The use of smoke- and obscurant-generating pyrotechnics is prohibited at the NTC.
- Ascends or descends from elevated positions by ladder, stairs, or using approved urban ascent/descent techniques.
- No running on rooftops; move in a controlled manner.
- All personal protection equipment must be worn when required.
- All injuries—no matter how slight—must be reported immediately.
- All posted signs and barriers must be obeyed.
- No live weapons or ammunition can be mixed with ESS equipment.
- Each person will inspect his/her magazines and ammunition to ensure no live rounds are present.
- No MILES firearm will be fired within 10 feet of another player. Participants must be cautious of hot gases vented from ESS weapons.
- Though the low-energy laser transmitters are considered “eye safe”, no one should stare into a transmitting laser any closer than 40 feet (13 meters) or look through an optical

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instrument any closer than 250 feet (80 meters). Training with MILES weapons requires wearing approved hearing and eye protection.

- If engagement occurs under 10 feet with MILES weapons, the participant will announce “DANGER CLOSE” and will signify a “kill”.
- No DMC firearm will be fired closer than 1 meter to another person.
- Participants will not stare directly into the beam of the laser on the MILES equipment.
- Use of physical force, hand-to-hand combat, etc., will not be allowed. Players taken out of play will sit down in place, and place all weapons on the ground.
- In the event of an actual medical emergency, an announcement will be made with “MAYDAY MAYDAY MAYDAY”. The Exercise Director will suspend all activities, and range emergency procedures will be initiated.
- If vehicles are used in training, all drivers must:
 - Obey laws related to vehicle operations
 - Observe posted speed limits during the exercise and must not exceed either 25 miles per hour in the controlled exercise area or a lower speed limit set by the Senior Controller.
 - Ensure all vehicle occupants wear safety belts, which are mandatory.
 - Not operate vehicle off roadways unless necessary for the exercise and with approval from safety and instructors.
 - Prohibit individuals from riding on the outside of the vehicle.
 - Report any damage to vehicles and equipment to instructors immediately.
 - Accelerate, decelerate, turn, etc., in a safe manner.
 - Prohibit mounting or dismounting the vehicle until it has come to a full stop with the transmission in park and the parking brake set.

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APPENDIX H – ESS CONTROLLER CHECK LIST

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ESS CONTROLLER CHECK LIST

COURSE:	
DATE:	
TRAINING LOCATION:	
SENIOR CONTROLLER:	

Exercise Guides: Exercise guides will be utilized in all NTC ESS training. All exercise guides will have the following information in accordance with DOE M 470.4-3 Chg 1 (or current version):

- **Exercise Objective:** The exercise objective must be stated succinctly. This will consist of a concise statement of the goal(s). These exercise objectives will be listed in an exercise guide.
- **Scenario Description:**
 - Describe the Threat Scenario. Define the target and the threat to provide an understanding of the nature of the exercise. Specific information in this area may be classified.
 - Describe the Facilities Involved. Establish the exercise boundaries and provide clear indication of the exercise area, the facilities involved, and out-of-bounds areas/limits.
 - Define the Required PF Response. Provide a description of the desired PF response to adversarial actions.
 - Establish the Schedule. Define exercise initiation, time, date, and schedule of events.

Safety: Exercises must be conducted with the highest regard for the safety and health of personnel, protection of the environment, and protection of Government property. All participants must receive an ESS safety briefing prior to any exercises.

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Command and Control: A system of command and control must ensure that ESS safety and other requirements of DOE M 470.4-3 Chg 1 (or current version) are met and maintain an environment free of the recognized risks associated with conducting training activities. The command and control system must ensure that rules of engagement (ROE) are followed, specific hazards and safety concerns, as identified in a risk assessment, are appropriately addressed, and exercise continuity is maintained.

Controller Responsibilities:

- Controllers are responsible for enforcing or implementing the following requirements during exercises.
 - Conducting safety checks and inspections of all personnel under their control for live rounds or other prohibited ammunition in DMC or MILES exercises. Safety checks and inspections should also be conducted for other prohibited articles for general safety.
 - Ensure no live firearms or ammunition of any type is allowed within the ESS exercise area.
 - Ensure exercise participants and observers wear and use appropriate safety equipment.
 - Ensure all exercise participants comply with the exercise plan to include ROE and safety regulations.
 - Ensure that all ESS weapons handling and manipulation procedures comply or are compatible with procedures for live fire training.
 - Terminate a specific activity or the entire exercise in unsafe conditions or acts are observed.
 - Ensure accountability of personnel and equipment at the termination of an exercise.

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Controller Positions:

- **Senior Controller:** Responsible for coordinating establishing and supervising the exercise controller staff and exercise.
- **Safety Controller:** Responsible for assessing the exercise plan and ensuring that walk downs of the exercise area and safety briefings are conducted as well as ensuring all safety requirements are being met.
- **ESS Controller:** Responsible for issuing and accounting for all ESS weapons and equipment, inspecting all ESS ammunition and collecting the equipment following an exercise.
- **Exercise Controller:** The exercise controller must possess sufficient tactical expertise, knowledge and physical ability to ensure that his/her presence does not interfere with or hamper the exercise. Exercise controllers must be assigned to both the Protective force and adversary force.
- **Event Controller:** Not applicable for NTC training activities.

Controller Assignments:

SENIOR CONTROLLER		
ESS CONTROLLER		
SAFETY CONTROLLER		
EXERCISE CONTROLLER		
EVENT CONTROLLER	NAME	ASSIGNMENT

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APPENDIX I – TRAINING SAFETY PLAN FOR TRAINING AND EXERCISES USING ENGAGEMENT SIMULATION SYSTEMS (ESS)

NOTE

**THIS DOCUMENT REQUIRES THE DEVELOPMENT AND APPROVAL
OF AN EXERCISE PLAN AND RISK ANALYSIS REPORT.**

I.1 ESS TRAINING

The Protective Force Training Department (PFTD) at the U.S. Department of Energy (DOE) National Training Center (NTC) conducts engagement simulation system (ESS) force-on-force and force-on-target training to provide a realistic environment for students to develop and hone skills associated with the Protective Force mission. The exercises involve individual and team tactical activities that may involve the stresses of assault by opposition forces (OPFOR). The NTC PFTD also periodically conducts force-on-force or force-on-target demonstrations for visitors that involve the use of ESS weapons and ammunition.

I.1.1 Purpose

The purpose of this plan is to:

- Identify and evaluate the potential hazards associated with the training activities covered by this plan.
- Ensure that those identified hazards are mitigated or eliminated so the health and safety of each participant have been adequately addressed and risk has been reduced to an acceptable level.
- Assign responsibilities for the control and conduct of training activities covered by this plan.
- Educate and inform all participants about the safety concerns associated with these training activities and the rules of conduct.

I.1.2 Realism and Safety

Both realism and safety are paramount in conducting meaningful and effective training at the NTC. All operations shall be performed with the highest regard for protection of personnel, property, and the environment, while maintaining a level of realism. It is accepted that ESS force-on-force training and force-on-target training are, by their very nature, inherently dangerous, and it is accepted that a certain level of risk is unavoidable. However, in the performance of force-on-force or force-on-target training, the NTC's goal is to provide as realistic an environment as possible to allow the students to hone and demonstrate the skills needed to successfully respond to threats during performance testing as well as actual threats at their DOE home site. At the same time, care must be used to prevent exposing the participants to unnecessary hazards. Therefore, a balance between safety and realism must be applied and this plan supports that goal.

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A training safety plan ensures that a systematic approach is used to identify, control, and mitigate training risks to an acceptable level. Safety rules must be followed to minimize the potential for accident or injuries during force-on-force or force-on-target training. Willful violation of safety rules will result in the immediate removal of the offending party from the test activity and may result in a recommendation for disciplinary action. Maximum effort will be made by NTC management, controllers, and training participants to anticipate and react to unsafe situations. As a matter of NTC policy, realism must be achieved and safety must be considered during the conduct of force-on-force and force-on-target exercises and demonstrations involving ESS. By integrating appropriate safety requirements into various training scenarios, NTC force-on-force and force-on-target training exercises and demonstrations contribute to enhanced performance by Protective Force personnel.

This plan applies to all participants—including students, controllers, evaluators, support staff, and observers—and will be in effect until training is terminated.

I.2 RESPONSIBILITIES AND AUTHORITY

I.2.1 Training Control

The Exercise Director/Senior Controller will comply with the following ESS training requirements:

- DOE Manual 470.4-3 Chg 1, Protective Force (or current version);
- PFT-SOP-644, Live Fire Range Operations;
- PFT-SOP-646, Engagement Simulation Systems;
- PFT-SOP-643, Integrated Safeguards and Security Training and Evaluation Complex (ISSTEC) Operations;
- The approved exercise plan; and
- This ESS Training Safety Plan.

The Exercise Director/Senior Controller and Exercise Controllers are responsible for both personnel safety and for enforcing safety requirements and rules of engagement during force-on-force and force-on-target training and ESS demonstrations.

The Exercise Director/Senior Controller, Safety Controller, and Exercise Controllers will work jointly to address and resolve safety issues. The Exercise Director/Senior Controller will ensure that appropriate safety briefings are conducted, safety protocols are understood, and safety procedures and rules of engagement are followed by all individuals during the conduct of the training. The Safety Controller will notify the Exercise Director/Senior Controller immediately of any safety concerns.

Exercise Controller positions required by DOE M 470.4-3 Chg 1, Protective Force (or current version), will be appointed in appropriate numbers and positioned by the Exercise Director/Senior Controller prior to the beginning of any ESS training exercises.

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The Exercise Controllers have field responsibility for controlling the exercise and ensuring safety during conduct of the training. The Exercise Controllers will ensure that all participants and observers are informed of all exercise training safety requirements. Exercise Controller duties include but are not limited to:

- Ensuring that participants do not enter out-of-play areas or cross training boundaries.
- Ensuring that participants do not engage in any unsafe actions.
- Ensuring that training is conducted in accordance with all applicable DOE directives, approved exercise plans, NTC SOPs, and this plan.
- Physically inspect assigned exercise training areas and participants to ensure that no unauthorized weapons or equipment, or training hazards, are present.
- Ensuring that participants have checked their weapons and ammunition to ensure that properly modified, dedicated, and approved ESS weapons and blank ammunition are present.
- Addressing health and safety issues immediately, and stop the training in the event of any accident, injury, or safety problem.
- Preserving accident/injury sites, and collecting and recording information regarding the accident or injury.
- Observing all training activities and providing feedback to the Exercise Director/Senior Controller for lessons learned.
- Notifying the Exercise Director/Senior Controller of personnel and equipment accountability after the training exercise is terminated.

I.2.2 Authority to Stop Training for Safety Reasons

All NTC training exercise participants have both the authority and obligation to stop any activity, without fear of reprisal, if they observe any unsafe condition or practice that would directly impact their safety or the safety of others, or result in a significant adverse impact on the environment.

I.2.3 Participating Organizations Responsibilities

All organizations or groups participating in or supporting NTC training will be responsible for identifying materials, equipment, or operations that may represent an environmental, safety, or health hazard. This may include: general industrial hazards; construction hazards; plant or animal hazards; explosive hazards; firearms; radioactive materials; criticality issues; toxic chemicals; motorized equipment and vehicles; high-temperature flame or heat-producing devices; and electrical equipment (above 24-volt DC) or power lines. Identified environmental, safety, or health hazards are addressed in the risk analysis report for the training exercise (Appendix B).

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I.2.4 Individual Participant Responsibilities

An individual's first concern is to maintain his/her safety and the safety of others commensurate with the mission requirements of the training. There will always be some level of risk involved in any training; however, the individual is responsible for assisting Exercise Controllers in preventing the level of risk from exceeding that addressed by this plan. Participants will wear the clothing and personal protective equipment (PPE) required for the training exercise. Participants should never attempt anything that is beyond their ability or training, or that has not been approved prior to the training. Participants must always be aware of their environment and any factors that affect them. Participants are responsible for knowing the pertinent information contained in this plan, the exercise plan (Appendix A), and the exercise risk analysis report (Appendix B), and for abiding by the requirements in these documents. Finally, participants must immediately report anything that increases the level of risk of the training to the Safety Controller or an Exercise Controller.

Each participant has an individual responsibility to:

- Immediately report unsafe acts or conditions, and stop any training activity that may result in significant impacts on the health and safety of themselves or others, or significant impacts on the environment.
- Report injuries, regardless of severity, to the nearest Exercise Controller.
- Avoid hazardous areas or off-limits areas.
- Monitor his/her physical condition and that of other team members for signs of overexertion.
- Observe other participants who appear injured or otherwise in need of assistance. Immediately cease activities in order to render appropriate aid and notify an Exercise Controller.
- Ascend to or descend from elevated positions by ladder, stairs, or using approved urban ascent/descent techniques.

I.3 MEDICAL AND FITNESS CONSIDERATIONS

I.3.1 Pre-existing Medical Conditions and Use of Medication

Participants taking prescription medication and/or with pre-existing medical conditions that could be exacerbated by the conditions, environments, or activities of the training shall report this fact to the Exercise Director/Senior Controller, the Safety Controller, or an Exercise Controller. The Exercise Director/Senior Controller will consult the exercise Paramedic to determine whether the individual may participate in the training.

Caution must be exercised when using over-the-counter medication such as antihistamines, cold medicines, or cough medicines, or stimulants such as energy drinks, coffee, cola, tea, or other caffeinated beverages.

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I.3.2 Physiological Hazards

Training can exert a great deal of physiological stress on the body, due in part to exercising specific muscle groups to a higher degree than normal. Training can combine the activities of lifting, pushing, climbing, running, jumping, crawling, and shooting, all within a very short period of time. This can be exacerbated when performing at the higher altitudes where NTC training occurs and in temperature extremes that may pose additional stresses. All participants are encouraged to be aware of the potential adverse impacts of the training activities on their bodies and report minor pain, nausea, dizziness, breathing difficulty, chest pain, or other discomfort or problems to an Exercise Controller immediately.

I.3.3 Bloodborne Pathogens

Due to the nature of NTC force-on-force training, the potential exists for minor injuries, including the potential exposure to human blood and other bodily fluids. All participants are reminded to use appropriate care to avoid contact with blood and other bodily fluids. Any potential contact with such fluids is to be reported to an Exercise Controller or Paramedic immediately. All participants will use appropriate precautions when rendering first aid (such as gloves and eye protection), and only render first aid in accordance with their level of training (see ESH-GP-522, Bloodborne Pathogens Exposure Plan).

I.3.4 Use of Alcohol, Illegal Drugs, or Other Substances

The consumption of alcohol impedes both mental and motor skills, interferes with the body's ability to retain fluids, and increases the risk of dehydration. Therefore, participants and support personnel will not consume alcoholic beverages within 8 hours prior to the start of training activities.

The possession of alcohol at an NTC training site is strictly prohibited. If an Exercise Controller detects the presence of alcohol on a participant, or if a participant is believed to be under the influence of alcohol, the Exercise Controller will remove the participant from the training immediately and appropriate follow-up action will be taken in accordance with pre-established DOE and NTC regulations and directives.

The use or possession of illegal drugs is strictly prohibited at all times. If an Exercise Controller detects the presence of drugs on a participant, or if a participant is believed to be under the influence of drugs, the Exercise Controller will remove the participant from training and appropriate follow-up action will be taken in accordance with established DOE and NTC regulations and directives.

I.3.5 Sleep Deprivation/Fatigue

Sleep deprivation/fatigue can result in poor judgment, bad decisions, and accidents. Therefore, NTC training participants will be "on duty" for no more than 14 consecutive work hours, immediately followed by a break from the training area (e.g., physically away from the area, for a minimum of 8 hours to allow sufficient time for bed rest, meals, and other necessities).

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NOTE: The Exercise Director/Senior Controller must ensure that participants have not worked for extended periods prior to their participation in this training. Any signs of participant fatigue will result in an Exercise Controller referring the participant to the exercise Paramedic for evaluation.

I.4 MEDICAL AND FIRE FIGHTING SERVICES

I.4.1 Notification of an Emergency

All injuries, incidents, and accidents must be reported immediately to the nearest Exercise Controller. Anyone observing a participant who is seriously ill or injured will immediately advise the nearest Exercise Controller and render aid if possible, being careful that the aid does not exceed their level of training. The Exercise Controller will summon the NTC Paramedic to treat the injured participant. The Safety Controller must also be notified of all injuries, even minor ones, so that appropriate documentation may be completed which will benefit the participant if the injury develops into a more serious problem after returning to his/her regular job site. In the event of a serious injury, the Exercise Director/Senior Controller and Safety Controller will be notified immediately and necessary emergency medical support will be requested. The NTC safety staff will investigate all exercise-related accidents and injuries (see ESH-GP-516, Accident Reporting and Investigation).

Prior to the conduct of training, participants will be briefed by Exercise Controllers on emergency resources available to the site (such as medical and fire fighting services) and the means to obtain them. Each participant will be instructed in how to alert emergency response personnel, both by radio or telephone.

I.4.2 First Aid

An NTC Paramedic will be available at all exercise training and demonstrations involving ESS. Participants will be briefed prior to the start of training on how to get medical assistance and where the NTC Paramedic will be located during the course of the exercise.

All NTC instructors serving as Exercise Controllers are first-aid and CPR trained, have first-aid kits available, and can render immediate aid to participants until the NTC Paramedic arrives.

I.5 PERSONNEL SAFETY

I.5.1 Hazard Awareness and Exposure Control

Individual participants must assume responsibility for protecting themselves from obvious hazards present in the exercise training area. The Exercise Director/Senior Controller will ensure that all potential exposures to hazards in the exercise area, including hazardous materials, will be maintained at as low a level as possible, or effectively mitigated or removed. Exercise Controllers will brief participants of potential exercise hazards prior to training and will ensure participants avoid activities that could result in an exposure to hazardous conditions or materials. Barriers and/or safety warning signs will be emplaced by Exercise Controllers prior to training to advise

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exercise participants of hazards or Out-of-Play areas. Any questions regarding hazard exposure to participants during training should be addressed to an Exercise Controller immediately (see ESH-GP-518, Hazard Controls and Personal Protective Equipment).

I.5.1.1 Physical Hazards

Pre-exercise safety briefings should address potential physical hazards in the exercise area such as: walking or training surfaces and uneven terrain; ascending to, or descending from, elevated areas; eye and hearing hazards; respiratory hazards; wildlife and vegetation hazards; motor vehicle hazards; barbed wire and fences; trenches, open holes, and excavated areas; nighttime or low-light hazards; and hazards peculiar to designated ESS training areas. Exercise Controllers will mark, mitigate, or remove physical hazards in the exercise training area.

I.5.1.2 Chemical and Biological Hazards

Chemical hazards include laboratory chemicals, hazardous materials, explosives, lead, asbestos, and bodily fluids. Exercise Controllers will brief participants on potential exposures and will mark, mitigate, or remove such hazards prior to training. The Exercise Director/Senior Controller will ensure the exercise training environment is controlled to limit or prevent participant exposure to the maximum extent possible.

I.5.1.3 Weather Hazards

Seasonal weather conditions dictate specific health and safety concerns. Hot summer weather concerns in New Mexico include glare, sunburn, dehydration, heat cramps, heat exhaustion, heat stroke, and exertional heat illness (EHI). Hot weather also brings an abundance of plant and animal activity, resulting in potential exposures to venomous snakes and spiders, biting insects, and wildlife possibly carrying harmful pathogens (e.g., rabies, hantavirus, and plague). Potential allergic reactions to a wide spectrum of plant life are possible. Hot dry winds send large amounts of dust and dirt in the air around NTC training areas that may impair vision, clog respiratory protection equipment, and foul delicate safety equipment.

Cold weather, low temperatures, and snow can represent significant health and safety hazards. Hypothermia results from prolonged cold exposure and heat loss. Frostbite damages skin and cells of the body. Uncontrolled shivering is a condition in which the body attempts stay warm. when it gets cold. Any of these cold-related conditions can adversely affect participant health.

The “*umbles*”—*stumbles*, *mumbles*, *fumbles*, and *grumbles*—can indicate how a person’s muscles and nervous system are reacting to extended exposure to cold weather. The following conditions may indicate that a cold-related illness is developing:

- Confusion or sleepiness
- Slowed, slurred speech, or shallow breathing
- Weak pulse or low blood pressure
- A change in behavior during cold weather or a change in the way they look
- A lot of shivering or no shivering
- Stiffness in the arms or legs

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- Poor control over body movements or slow reactions.

NOTE: If a person's body temperature drops below 96°F, call for the NTC Paramedic.

Snow represents a potential for bodily injury and illness due to the associated low ambient air temperatures as well as the increased chance for slips and falls. Additionally, property damage concerns increase while operating motor vehicles over snow and ice-covered surfaces.

Lightning strikes are a real hazard in New Mexico. Some training may take place in areas where the training areas and personnel are in open and/or elevated areas. Pre-exercise safety briefings will include procedures for actions to take when there is a lightning potential in the area.

Heavy rains and/or high winds in a desert environment can represent potentially serious safety hazards during training.

The Exercise Director/Senior Controller and the Safety Controller will consult PFT-SOP-652, Inclement Weather Training Criteria, for specific guidance on adverse weather conditions.

I.5.2 Use of Safety Equipment

Safety equipment and PPE appropriate to the training activities will be used during training exercises. Exercise Controllers will inspect safety equipment for usability and operability prior to the initiation of the training. Participants are ultimately responsible for their safety and are expected to wear required PPE and clothing appropriate to the training and environment. Unserviceable equipment will not be issued, or will be immediately removed from service if it has been issued. Questions on the serviceability of safety equipment will be resolved by the Safety Controllers prior to training.

Safety equipment and PPE will be used only for their intended purpose, in accordance with the manufacturer's instructions, and in compliance with applicable laws and standards. Safety equipment and PPE will not be altered in any way that could preclude them from performing their intended safety functions.

Examples of the types of safety equipment and PPE that may be used include:

- Hand-held radios
- Hand-held weather stations
- Tactical clothing and equipment
- PPE (eye, hearing, and head protection, knee and elbow pads)
- Protective masks
- First-aid kits
- High-top boots with ankle support.

Eye protection shall comply with ANSI Z87.1-2003, and hearing protection shall have a noise reduction rating (NRR) of 26 or higher.

See ESH-GP-518, Hazard Control and Personal Protective Equipment.

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Some training may involve the use of protective masks by participants. Participants using protective masks must have been certified under an existing DOE site respirator program prior to arrival at the NTC for training.

I.6 ADMINISTRATIVE CONTROL OF ESS TRAINING

I.6.1 Authorized ESS Training Areas

NTC training involving ESS will be performed only in areas specifically designated as ESS training areas. ESS training outside of approved areas will only be done with the written approval of the DOE/NTC Director. Areas currently approved for ESS training are the Integrated Safeguards and Security Training and Evaluation Complex (ISSTEC) and the No Sweat Blvd. training area.

NOTE: Training at the No Sweat Blvd. training area requires prior approval by the 377th Air Base Wing Safety Controlled Firing Area Committee.

I.6.2 Boundaries and Off-Limits Areas

Exercise training area boundaries will be prescribed by the Exercise Director/Senior Controller based on the training area and the tactics to be employed. Training area boundaries will be appropriately marked and identified to all participants during the pre-training safety briefing.

Off-limits areas are dictated by hazards and characteristics of the training area and will be determined during the safety walk-down by Exercise Controllers prior to the training. Off-limits areas will be marked and identified to all participants during the pre-training safety briefing.

I.6.3 Exercise Freeze

An EXERCISE FREEZE is a hold on training that is used to correct significant safety-related problems or to respond to an actual emergency. Any person observing a life-threatening situation has the responsibility to initiate an EXERCISE FREEZE. This is accomplished by alerting an Exercise Controller, who will then notify the Exercise Director/Senior Controller. When an EXERCISE FREEZE occurs, EVERY PARTICIPANT must immediately stop what he or she is doing, remain in place, and follow the directions provided by their Exercise Controller. If an Exercise Controller is not present, participants should stop what they are doing, sit down, safely ground their weapons, and await further instructions.

I.6.4 Administrative Hold

An "Administrative Hold" is a procedural hold to correct an administrative problem or a planned temporary hold to set the stage for continuation of the exercise. Any Exercise Controller may call an Administrative Hold in his/her area, but only the Exercise Director/Senior Controller may call an Administrative Hold of the entire exercise. Administrative Holds will normally be limited to specific locations rather than exercise-wide. Administrative Holds will not be called to correct emergency or safety situations

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(see EXERCISE FREEZE above). Exercise Controllers will announce the Administrative Hold in the affected area, and all activity in the area will immediately halt, with participants remaining in place.

I.7 ESS WEAPONS SAFETY AND RULES OF CONDUCT

All participants shall conduct their activities and weapons manipulations in conformance with DOE M 470.4-3, Chg 1, Protective Force (or current version); PFT-SOP-644, Live Fire Range Operations; and PFT-SOP-646, Engagement Simulation Systems.

Participants shall conduct their training activities in such a manner as to inflict the least damage to the training environment. Exercise Controllers will ensure each training location is restored to its original condition and left clean and free of exercise residue.

Exercise Controllers will wear distinctive colored safety vests during the day and colored chemical light sticks at night. Observers and support personnel will be identified by highly visible means (also wearing colored reflective safety vests during the day and colored chemical light sticks at night).

I.7.1 ESS Weapons Safety Rules

ESS that may be used in NTC training includes Multiple Integrated Laser Engagement Systems (MILES), dye marking cartridge (DMC) systems, MILES/DMC hybrid systems, air-soft systems, blank fire weapons, inert weapons, and explosive simulators. Only ESS weapons and ammunition that are approved by the DOE Office of Health, Safety and Security (HSS) and/or have undergone HSS-approved modifications may be used in NTC ESS training.

ESS exercise participants are responsible for the safe use of their ESS weapons. Exercise Controllers will ensure that the following conditions are met:

- No live-fire weapons or ammunition will be allowed in ESS exercise training areas.
- ESS weapons and ammunition will be store separately from live-fire weapons and ammunition and never intermingled.
- ESS rifles, submachine guns, and handguns shall be appropriately modified/configured by certified NTC gunsmiths, prominently marked, and dedicated for ESS only.
- ESS weapons used (with the exception of simulated anti-tank weapons and explosive simulators) shall be equipped with blank fire adapters, live round inhibitors, and/or have undergone the DOE-approved "porting" modification.
- ESS magazines shall be modified to use only HSS-approved ESS ammunition, be clearly marked, and have live round excluders.
- The ESS Controller will ensure only properly modified and marked ESS weapons and approved ESS ammunition are issued for use in training exercises.

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- Prior to training, all participants shall inspect their weapons and ammunition to ensure that only ESS weapons and ammunition are to be used.
- Participants are reminded that hot propellant gases are vented from the side of revolvers when fired.
- Participants shall not load weapons until training has begun and they have been directed to load by an Exercise Controller.
- At the conclusion of the ESS training, unused ammunition will not be fired but will be turned in at the designated location for use in future training.
- No ESS weapons will be loaded or fired in buildings, or from vehicles, unless approved in the ESS Training Safety Plan or until directed by an Exercise Controller.

I.7.2 General ESS Rules of Conduct

Each participant is responsible for his/her own safety and the safety of those around them. Exercise Controllers will carefully monitor participant activities and use of ESS weapons. Rules of engagement for the exercise are in the exercise plan (see Appendix A). The following general rules of conduct apply to all tactical training involving the use of ESS:

- NTC ESS training will only be performed in designated and approved ESS training areas. Current approved areas are the No Sweat Blvd. training area and the ISSTEC. ESS training in any other area must receive prior written approval from the DOE/NTC Director.
- Entry to ESS training areas will be strictly controlled. Signs will be posted advising that ESS training is in progress and that live weapons or ammunition are prohibited. All persons, vehicles, and equipment entering the ESS training area will be searched for live weapons and ammunition. Persons or vehicles leaving the ESS training area will be searched upon re-entry.
- An orange and blue streamer will be displayed at the ISSTEC when ESS training is in progress during the day. At night, a rotating orange and blue light will be activated.
- Participants must not point or fire a MILES weapon at anyone closer than 10 feet or fire a DMC weapon at anyone closer than 1 meter (3 feet). In the event a participant suddenly becomes aware of another participant within 10 feet (MILES) or 3 feet (DMC) of their location, no attempt shall be made to fire their weapon. Rather, the participant making the discovery shall immediately shout "DANGER CLOSE," and an Exercise Controller will make the call on who survived the encounter.
- ESS MILES and MILES/DMC hybrid equipment operates by the firing and detection of specially encoded laser signals. Transmitters of all laser engagement systems used in training must carry caution stickers that are visible to persons in the vicinity of the transmitter and must advise the following:

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***INVISIBLE LASER RADIATION.** Do not stare into beam within 40 feet of the laser and do not view with optical instruments, such as binoculars, within 250 feet.*

The lasers used in the ESS equipment do not present an undue hazard to the eyes during normal operations, and no special eye protection is required. The lasers must meet the U.S. Food and Drug Administration eye safety requirements found in 21 CFR 1040.10 and 11 and ANSI Z136.1-6.

- All ascents to, or descents from, elevated positions shall be by ladder, stairway, or other safe method, except as otherwise authorized.
- No training on rooftops will occur except in designated rooftop training areas such as that found at the ISSTEC Building 9825H rooftop fighting positions. Rooftop operations will only be performed under the supervision of an Exercise Controller. Participants shall not approach within 6 feet of a roof edge without approved fall protection measures in effect.
- Only knives and other cutting implements necessary to perform training essential activities will be permitted within ESS training areas. They shall not be used as weapons or to simulate weapons.
- All participants are reminded that while training realism is important, DOE or the NTC are not exempt from their obligations under the Occupational Safety and Health Act. Each participant is responsible for complying with all applicable Occupational Safety and Health Administration (OSHA) requirements of 29 CFR 1910.
- Unauthorized personnel will be excluded from ESS exercise training areas. Authorized observers in an ESS training area will be under the control of an Exercise Controller at all times and will not be permitted to intrude into exercise activities. They will also wear required PPE and distinctively colored reflective vests during the day and distinctively colored chemical light sticks at night.
- Authorized non-play or support (“invisible”) vehicles in the ESS training area will be distinctively marked with colored, high-visibility ribbons during the day and with chemical light sticks at night. The markings on the vehicle must be visible from above, front, back, and both sides.

I.7.3 Exercise Controllers

Exercise Controllers will be assigned by the Exercise Director/Senior Controller in accordance with DOE M 470.4-3 Chg 1(or current version), Protective Force, and PFT-SOP-646, Engagement Simulation Systems. Exercise Controller positions are specified in the approved exercise plan. Exercise Controllers will accomplish the responsibilities of the following assigned controller positions:

- Exercise Director – Has overall responsibility for the exercise, to include pre-planning activities, assuring command and control during the exercise, and follow-up for lessons learned.

The Exercise Director ensures appropriate exercise safety measures are in place;

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signals the beginning and end of the exercise; supervises other Exercise Controllers; and has final authority for exercise halts for potential safety concerns.

- Senior Controller – Reports directly to the Exercise Director and is responsible for coordinating, establishing, and supervising the exercise control staff, identifying the number of control staff required for the exercise, ensuring adequate controller training is provided, and implementing the concept of operation for the Exercise Director. The Senior Controller ensures: controllers have attended onsite, pre-exercise controller training and scenario orientation; a sufficient number of qualified controllers are available to support the training; all participants are briefed on exercise scenarios, rules of engagement, safety concerns, emergency procedures, medical response, ammunition and firearms safety, and vehicle and personnel safety; OPFOR personnel receive site-specific procedures for ESS exercises, safety briefings, and participate in training site safety walk-downs; and that exercise debriefings are conducted.

NOTE: The Senior Controller may also serve as the Exercise Director.

- Safety Controller – Has responsibility for assessing the exercise plan, ensuring that walk-downs of the exercise area are performed, and ensuring required safety briefings are conducted and contain the required information. The Safety Controller ensures the adequacy of controller staff training; pre-exercise safety walk-downs of the training area are performed by the appropriate controller staff; and fire and medical support procedures are in effect.
- OPFOR Controller – Must possess the tactical expertise, knowledge, and ability to ensure the OPFOR effectively conducts exercise roles as planned and in a safe manner without interfering in exercise scenarios. The OPFOR Controller ensures voice communications are maintained with the Senior Controller for the duration of training, and OPFOR members adhere to scenario requirements and rules of engagement at all times.
- Event Controllers – Report to the Senior Controller and are responsible for control over specific exercise events or functions (e.g., specific scenarios and/or training locations, vehicle operation, VIP or visitor control). Event Controllers ensure participants follow exercise scenario and safety requirements in their areas of responsibility; control of loading, unloading, and firing of participant ESS weapons; training is stopped for safety reasons or emergencies; participants are wearing required PPE; participants have no live weapons or ammunition; proper management, handling, and employment of explosive simulators during the exercise; and communications equipment operates at all times.
- ESS Controller – Has specific responsibilities to the Exercise Director/Senior Controller for the issuance of ESS weapons, ammunition, and equipment. These responsibilities include:
 - Ensuring that all exercise participants are familiar with the basic operation, care, and use of the ESS equipment before issuance.

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- Ensuring ESS weapons and ammunition are only issued in areas where live weapons and ammunition are not stored or located.
- Ensuring ESS equipment is only issued after a physical search of participants and their equipment reveals no live weapons or ammunition are on their person. Any participant or vehicle leaving the ESS training area shall be subject to re-search prior to re-entry into the ESS training area.
- Ensuring that fresh batteries are installed in MILES harnesses and in the laser transmitters of MILES weapons.
- Ensuring that MILES harnesses are activated, functioning, and properly worn.
- Ensuring that MILES laser transmitters are functioning.
- Ensuring that ESS weapons have been modified to inhibit introduction of live ammunition into a weapon and are appropriately marked.
- Ensuring that ESS magazines are properly modified with live-round excluders and color-coded.
- Ensuring that ESS magazines are only loaded with approved ESS ammunition.
- Ensuring that test-firing of ESS weapons is conducted only in approved locations.
- Ensuring that ESS weapons and ammunition are kept segregated from live-fire weapons and ammunition.

I.7.4 End of Training Accountability

At the end of ESS exercise training activities, Exercise Controllers will account for exercise personnel, accidents/injuries, and equipment under their control, and advise the Exercise Director/Senior Controller accordingly. ESS weapons and ammunition shall be collected and accounted for by the ESS Controller, who will advise the Exercise Director/Senior Controller when all ESS weapons and ammunition are accounted for.

I.7.5 ESS Training Requirements

NTC Controllers must have received ESS training from a qualified instructor before they will be permitted to engage in ESS training. NTC Controllers who will be using or handling explosive simulators must have received training from a qualified instructor prior to using such devices in support of ESS training. Only trained and certified personnel will handle, emplace, arm, disarm, and remove explosive simulator devices in exercise training areas or on exercise vehicles.

NOTE: NTC ES&H staff must approve the use of vehicle explosive simulator systems prior to their use.

NTC personnel operating any hazardous equipment in support of ESS training must be trained in its proper use, and documentation to that effect must be available to the ES&H

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staff prior to the training. The NTC ES&H staff will be a functional part of pre-training activities.

The Exercise Director/Senior Controller will ensure all ESS exercise participants receive proper instruction in the ESS weapons and equipment that they will be using, including a comprehensive pre-exercise safety briefing. Non-NTC participants who will be employing explosive simulators during the ESS exercise must receive training in the safe use of, hazards associated with, and PPE requirements for the simulators to be used.

I.8 PYROTECHNIC AND EXPLOSIVE SAFETY

I.8.1 Responsibilities

NTC personnel who work with ESS pyrotechnics and explosives must be trained and qualified in the tasks to be performed. They must understand all safety procedures, precautions, and PPE requirements that apply to the transport, handling, and use of ESS pyrotechnics and explosives. Exercise Controllers will ensure that operations are conducted in a manner that exposes the minimum number of people to the smallest quantity of explosives for the shortest period of time, consistent with the activities being conducted. Exercise Controllers will further ensure that residue from ESS pyrotechnic and explosive items is removed from the training area and properly disposed of (see the NTC's SOP on pyrotechnics and explosives).

I.8.2 Transportation, Handling, and Storage of Munitions

The Exercise Director/Senior Controller is responsible for the transportation of approved ESS ammunition to the training site. Transportation will be conducted in accordance with U.S. Department of Transportation regulations (49 CFR). ESS pyrotechnics and explosives are not to be carried in privately owned or rental vehicles.

ESS ammunition shall be protected from abnormal stimuli or environments such as impact, shock, high temperatures, and open flames.

Smoking is prohibited within 100 feet of areas in which ESS ammunition is handled, transported, or stored. No matches, lighters, or other flame- or spark-producing devices shall be taken into an ESS ammunition storage area. Appropriate signs or marking shall be posted at such areas (see the NTC's SOP on the storage and transport of explosives).

Live-fire weapons and ammunition are not part of ESS training and will not be allowed in the ESS exercise area during the conduct of training.

I.8.3 Lightning Storms

Outdoor ESS training shall be discontinued during lightning storms that are within 3 miles of an ESS training area. Completion of a test involving explosives after receipt of a lightning alert may be continued only if test preparation has progressed to the extent that discontinuance of testing would represent a greater personnel exposure than completion of testing (see PFT-SOP-652, Inclement Weather Training Criteria).

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I.8.4 Smoke Grenades

Until the DOE moratorium on the use of smoke is lifted, smoke grenades will not be utilized in support of NTC ESS training.

I.8.5 Pyrotechnic Devices

All pyrotechnic devices generate sufficient heat to start fires. These devices shall be used only in areas identified as safe by the NTC ES&H staff.

I.8.5.1 LAW/VIPER/RPG Simulators

These electromechanically-fired simulators ignite at, and shoot a flame from, the rear. Anyone firing a LAW/VIPER/RPG simulator is responsible for verifying that the danger zone is clear. The danger zone is generally 30 feet to the rear and 5 feet to either side. The operator shall not arm the device until the target is sighted. If the device is not fired, it must be returned immediately to the safe position. Prior to turn-in, if the device is not fired, it shall be returned to an unloaded/tube-empty position. Personnel who will fire the devices in ESS training shall receive comprehensive instruction on their operation and safety considerations before using them. LAW/VIPER/RPG simulators will only be used in designated areas that have been approved by the ES&H staff.

I.8.5.2 Vehicle Hit Indicator System

The ESS Vehicle Hit Indicator System is designed to simulate and react to weapon fire. These devices are normally mounted on the roofs of vehicles. Blasts are vented upward and usually do not present a hazard. However, participants must not position themselves above or within 10 feet of the devices while outside the vehicle. Only trained technicians will handle these systems.

I.8.5.3 Hand Thrown Simulators

Participants using hand thrown simulators (diversionary devices) must receive training in their proper use and the injuries they are capable of inflicting if not used properly. A pre-exercise safety briefing will be provided that includes the proper deployment and use of such devices, the safety hazards associated with their use, and required PPE.

Full-charge simulators may not be thrown any closer than 50 feet to another person in an outdoor location and may only be employed in approved outdoor areas of the ISSTEC. Reduced-charge simulators may be employed inside of rooms and hallways of ISSTEC Building 9825H but only under the supervision of an Exercise Controller.

I.8.6 Dud Explosives

Unexploded (dud) ESS explosive simulators and pyrotechnics should only be handled by trained NTC personnel. All ESS training participants will be advised to never touch, move, or otherwise disturb dud ammunition, to mark its location, and to report it immediately to an Exercise Controller. Exercise Controllers will ensure no one approaches or handles dud simulators.

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Unexploded ESS training ammunition will be disposed of in accordance with procedures in PFT-SOP-644, Live Fire Range Operations.

I.9 VEHICLE SAFETY

I.9.1 General Requirements

Prior to entry into an ESS exercise area, exercise vehicles will be searched by Exercise Controllers to ensure that they do not contain any live-fire weapons or ammunition. After being searched, the vehicles will be under the control of a Vehicle Controller at all times until training is completed.

The Vehicle Controller will advise participants that weapons must be unloaded and on SAFE when entering exercise vehicles, with pistols holstered and rifles pointed to the floor. If firing is permitted from a vehicle during an exercise, the Vehicle Controller will direct participants when to load and fire. Weapons will not be loaded and fired unless directed by the Vehicle Controller. The Vehicle Controller will ensure windows are rolled down, weapon muzzles safely extend from the vehicle prior to firing, and all vehicle occupants are wearing hearing and eye protection.

I.9.2 Vehicle Operation

Exercise vehicles will be operated safely by licensed operators while supporting ESS training to minimize risk to the driver, passengers, and other training participants. The exercise vehicle driver will observe all laws relating to vehicle operation. No one will mount or dismount a vehicle until it has come to a complete stop, the parking brake is set, the engine is off, and the vehicle transmission placed in "PARK." Posted speed limits must be observed during the exercise and must not exceed either 25 miles per hour in the controlled exercise area or a lower speed limit set by the Senior Controller.

There will be no attempt to use a vehicle to block, crash, or in any way endanger another vehicle, person, or property. All acceleration, deceleration, cruising, turning, and braking will be accomplished with reasonable care and judgment. Vehicle operators are to take precautions to avoid accidents due to wildlife crossing roads. This is especially important during periods of reduced visibility such as at twilight and night and during periods of rain, dust, or fog.

I.9.3 Seat Belts

The drivers and all passengers in exercise vehicles are required to wear seat belts and shoulder restraints, as provided, when the vehicle is moving.

I.9.4 Riding in Vehicles

No one will be permitted to ride in the back of an exercise pick-up truck or on the outside of any other exercise vehicle.

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I.9.5 Headlights

Exercise vehicles operated at night or in conditions of reduced visibility will have their headlights turned on.

Within a controlled area, use of night vision may be substituted for standard vehicle lights as described in the exercise plan.

I.9.6 Following Distance

A safe distance must be maintained between exercise vehicles. To accomplish this, the 2-second rule will be in effect during training (that is, a vehicle following another vehicle should never be closer than 2 seconds to the vehicle it is following, regardless of the speed it is traveling).

I.9.7 Off-Road Operation

Vehicles will not be operated off roadways or paved road surfaces unless it is necessary to the exercise scenario and is directed by the Vehicle Controller.

I.10 Site-Specific Requirements

I.10.1 General Requirements

ESS training at the NTC will be governed by DOE M 470.3-4, Chg 1 (or current), Protective Force; PFT-SOP-644, Live Fire Range Operations; PFT-SOP-646, Engagement Simulation Systems; the approved exercise plan; and this training safety plan.

I.10.1.1 Limited Access

Access to ESS training areas will be limited to authorized personnel only (e.g., Exercise Controllers, trainees, OPFOR personnel, technical support personnel, NTC Paramedics, ES&H staff, and authorized observers). ESS training areas will be well-marked, and entry control will be restricted to authorized personnel and vehicles.

I.10.1.2 Exercise Controller Training

NTC Protective Force Training Department staff serving as Exercise Controllers will meet the training requirements in NTC SOP 311, Instructor Certifications and Qualifications, and PFT-SOP-646, Engagement Simulation Systems.

I.10.1.3 ESS Training Area

NTC areas designated and approved for ESS training are the No Sweat Blvd. training area and the ISSTEC.

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I.10.2 Safety During Training

I.10.2.1 General Health and Safety Requirements

- NO open flames in training area(s).
- NO smoking.
- Ascends or descends from elevated positions by ladder, stairs, or using approved urban ascent/descent techniques.
- NO use of smoke or riot control agents.
- Trash and exercise residue should be placed in trash receptacles or disposed of properly.
- ESS participants will wear designated PPE, appropriate clothing, and sturdy footwear.
- ESS participants will obey all posted signs.
- All persons in the ESS training area will be under the control of an Exercise Controller at all times.

I.10.2.2 Movement Under Control/Avoiding Hazards

There are a variety of hazards and potentially hazardous locations at NTC training facilities, and all participants must be aware of them. Some of the locations and conditions are:

- Rooftops, which are fall hazards (if not one of two designated ESS fighting positions on Building 9825H).
- Rooms and hallways with furniture and other obstacles, which may be trip hazards.
- When entering a building, be aware that there may be only minimal interior lighting and that the hallways and stairways may be dark. Move cautiously around inside the facility.
- Do not climb over furniture or other barriers in buildings.
- Do not lean over barriers to elevated open areas, or attempt to lean out of windows.
- When climbing stairs, use hand rails.
- In cold weather, some rooms and hallways in Building 9825H may have ice on the floor.
- Uneven terrain, vegetation, wire, fences, gullies, holes, and other obstacles can

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make overland movement hazardous during daylight and at night. Move cautiously and deliberately at all times.

- Altitude and dry climate can result in rapid dehydration. Drink water frequently.

I.10.2.3 Physical Conditioning – Heat/Cold Stress

Participants are expected to arrive at the NTC in a physically fit condition prior to training. Exercise Controllers will carefully monitor all participants for evidence of fatigue, heat or cold injury, or other illness, and will summon the NTC Paramedic immediately if necessary. Exercise Controllers will ensure rest breaks occur frequently, participants drink plenty of fluids, and breaks are taken in the shade in hot weather and in warm areas in cold weather.

NTC training participants are responsible for monitoring their own physical condition at all times and watching out for signs of overexertion, heat stress/cold stress, and fatigue in other participants. Participants will render assistance to other participants who appear ill or injured and report the situation to an Exercise Controller immediately. Heat and cold stress monitoring and emergency response actions will be covered in the pre-training safety briefing.

I.10.2.4 Reporting Safety Hazards and Injuries

At any time during training, a participant should immediately report unsafe conditions to an Exercise Controller. The reported condition will be resolved prior to continuing training. Additionally, all injuries, however minor, should be reported to an Exercise Controller. If necessary, the NTC Paramedic will be called, an accident/incident investigation will be performed, and a written report prepared.

I.10.2.5 Medical and Emergency Response

The Exercise Director/Senior Controller is responsible for ensuring adequate arrangements exist for securing emergency medical support, or response to a fire, in the ESS training area.

I.10.2.6 First Aid and Emergency Transport

The Exercise Director/Senior Controller will ensure that an NTC Paramedic is scheduled to support all ESS training. The NTC Paramedic has all life support equipment necessary to provide treatment to a seriously ill or injured person until other medical support arrives. The NTC Paramedic does not have certification, or the means, to transport injured persons.

An ambulance from Sandia National Laboratories or Albuquerque Ambulance Service can be secured by dialing 911 (844-0911 by cell phone). Arrival at the training site can be expected in 30 to 40 minutes. A civilian medical evacuation helicopter can also be summoned for life-threatening injuries by dialing 911 (844-0911 by cell phone) and can arrive in approximately 15 minutes.

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I.10.2.7 Fire Fighting and Other Emergency Services

Kirtland Air Force Base Fire Department will respond to fires by dialing 911 (844-0911 by cell phone) and is available 24-hours a day. Exercise Controllers will have portable fire extinguishers available at ESS training sites.

I.10.3 General Industry, Radiological, and Other Hazards

I.10.3.1 General Industrial Hazards

All DOE sites possess a variety of recognized general industrial safety hazards. These hazards may be found in OSHA Standards 29 CFR 1910 and CFR 1926; National Institute of Occupational Safety and Health (NIOSH), American National Standards Institute (ANSI), and other professional organization guidelines, as well as applicable DOE directives.

I.10.3.2 Radiological Hazards

There are no radiological hazards at NTC ESS training sites.

I.10.3.3 Industrial Hygiene

Weapons cleaning solvents, lubricants, and degreasers are used to clean ESS weapons. Selection of NTC weapons cleaning agents is based on reduced levels of harmful materials, and ESS weapons are cleaned in well-ventilated areas. Latex gloves and barrier hand creams are provided to persons cleaning weapons, and Material Safety Data Sheets (MSDS) for weapons cleaning agents are posted in cleaning rooms (see ESH-GP-520, Hazard Communication Program).

Due to the discharge of ESS firearms, there is the possibility of both airborne and surface lead contamination at or near ESS training sites, but the contamination levels are considered to be quite small. All NTC staff and persons training at NTC facilities are members of a lead-testing program at their home site that regularly monitors blood-lead levels. Additionally, persons training at the NTC are briefed on good personal hygiene measures to keep lead exposure to a minimum. Semi-annual lead tests are performed at NTC ranges to determine if acceptable levels of lead are being exceeded (see ESH-GP-521, Lead Monitoring Program).

The noise from ESS weapons and explosive simulators may exceed threshold hearing levels prescribed by OSHA. All persons engaged in ESS training are required to wear barrier-type hearing protection with a NRR of 26 or higher. Additionally, persons training at the NTC are enrolled in Hearing Conservation Programs at their home sites that regularly monitor individual hearing acuity for indications of degradation from exposure to hazardous noise levels (see ESH-GP-519, Hearing Conservation Program).

The NTC Industrial Hygiene Program is described in ESH-GP-524, Industrial Hygiene Program.

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I.10.3.4 Environmental

The NTC ensures good stewardship of the environment by complying with Environmental Protection Agency requirements for construction, training, and land use as described in ESH-GP-538, National Environmental Policy Act (NEPA) Compliance; ESH-GP-539, Waste Management Program; and ESH-GP-540, Hazardous Materials Release Containment Plan.

ATTACHMENT 1 – EXERCISE PLAN

An exercise plan for the proposed course or exercise must be developed, approved, and inserted here.

NON-PROPRIETARY INFORMATION

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ATTACHMENT 2 – RISK ANALYSIS REPORT

A risk analysis report for the proposed course or exercise must be developed, approved, and inserted here.

NON-PROPRIETARY INFORMATION

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ATTACHMENT 3 – REFERENCES FOR APPENDIX I

DOE Manual 470.4-3, Chg 1 (or current version), Protective Force

NTC-PM-501, Integrated Safety Management System Manual

NTC-SOP-531, Risk Analysis

ESH-GP-516, Accident Reporting and Investigation

ESH-GP-518, Hazard Controls and Personal Protective Equipment

ESH-GP-519, Hearing Conservation Program

ESH-GP-520, Hazard Communication Program

ESH-GP-521, Lead Monitoring Program

ESH-GP-522, Bloodborne Pathogens Exposure Plan

ESH-GP-524, Industrial Hygiene Program

ESH-GP-525, Fire Protection Program

ESH-GP-538, NEPA Compliance

ESH-GP-539, Waste Management Program

ESH-GP-540, Hazardous Materials Release Containment Plan

PFT-SOP-643, Integrated Safeguards and Security Training and Evaluation Complex (ISSTEC)
Operations

PFT-SOP-644, Live Fire Range Operations

PFT-SOP-646, Engagement Simulation Systems

PFT-SOP-649, Storage and Transportation of Explosives

PFT-SOP-650, Pyrotechnics and Explosives

PFT-SOP-652, Inclement Weather Training Restrictions

PFT-SOP-653, Paramedic Program

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